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ACORN USER

NOVEMBER 1992

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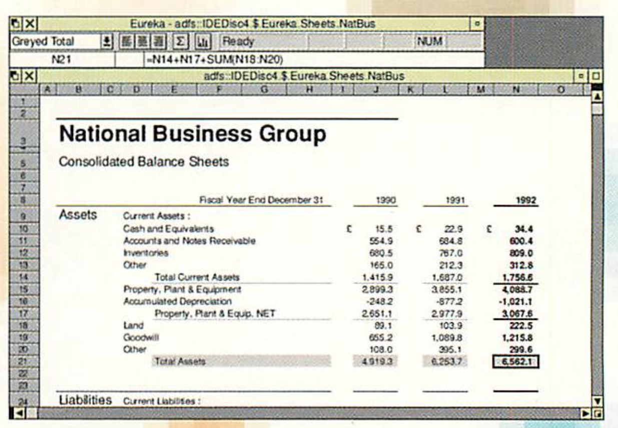
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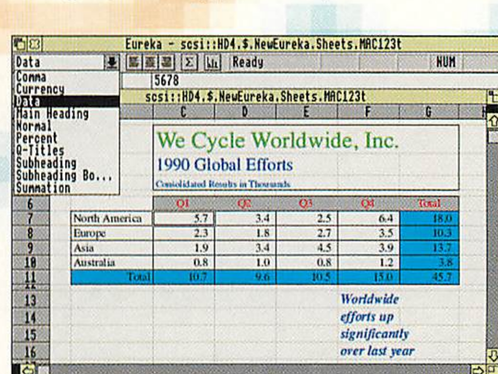

ISSN 0263-7456
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EUREKA!

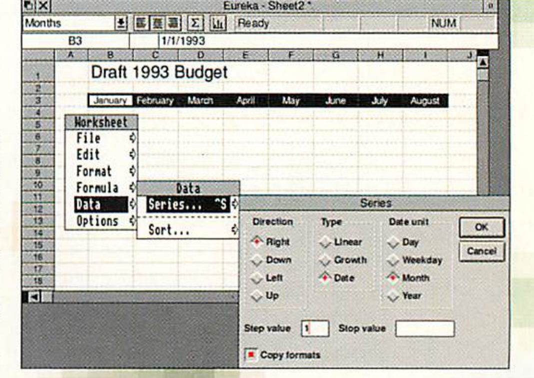
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MEAN B



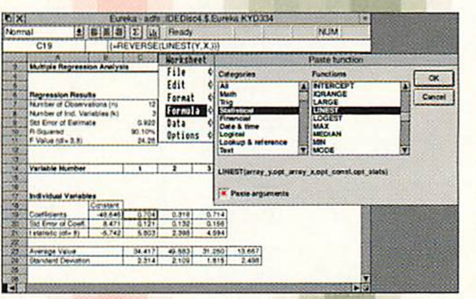
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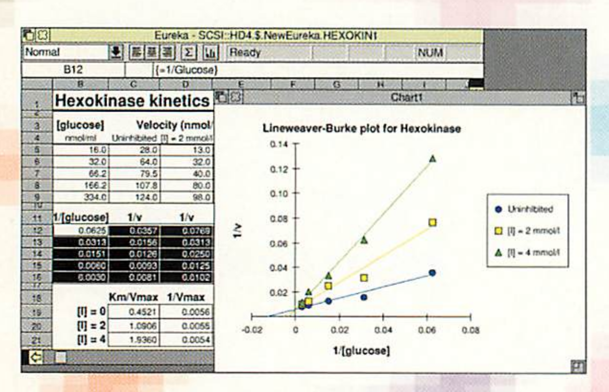


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…OPLE WHO …USINESS



Eureka offers crisp, accurate business charting in a wide variety of formats.

Eureka - adfs::IDEDisc4.$.Eureka.MULTREGR *

Normal | Ready | NUM

G4 {=TREND($E$4:$E$28,$C$4:$D$28,)}

Multiple Regression Example

The computed regression equation is: y = 0.0155+0.2235*x1-…

Year	% Net Revenues Per Deposit (x1)	# Offices (x2)	% Profit Margin (y)	Computed Y (by hand)	Computed Y (by TREND)
1	3.92%	7,298	0.75%	0.67%	0.67%
2	3.61%	6.855	0.71%	0.71%	0.71%
3	3.32%	6.636	0.66%	0.70%	0.70%
4	3.07%	6.506	0.61%	0.67%	0.67%
5	3.06%	6.450	0.70%	0.69%	0.69%
6	3.11%	6.402	0.72%	0.71%	0.71%
7	3.21%	6.368	0.77%	0.74%	0.74%
8	3.26%	6.340	0.74%	0.76%	0.76%
9	3.42%	6.349	0.90%	0.79%	0.79%
10	3.42%	6.352	0.85%	0.79%	0.79%
11	3.45%	6.361	0.75%	0.79%	0.79%
12	3.58%	6.369	0.70%	0.82%	0.82%
13	3.66%	6.546	0.78%	0.80%	0.80%
14	3.78%	6.672	0.84%	0.79%	0.79%
15	3.82%	6,890	0.79%	0.75%	0.75%
16	3.97%	7,115	0.70%	0.73%	0.73%
17	4.07%	7,327	0.68%	0.70%	0.70%
18	4.25%	7,546	0.72%	0.69%	0.69%

Page right

Page down

Normal	b2	b1	a
Coefficients:	-2.4E-06	0.223549	0.015515
Standard errors:	3.57E-07	0.061916	0.000885
R^2, SE est:	0.833101	0.000594	
F, df:	54.90812	2	
SSR, SSE:	3.87E-05	7.76E-06	

Transposed (should be identical to above)	b2	b1	a
Coefficients:	-2.4E-06	0.223549	0.015515
Standard errors:	3.57E-07	0.061916	0.000885
R^2, SE est:	0.833101	0.000594	
F, df:	54.90812	2	
SSR, SSE:	3.87E-05	7.76E-06	

Eureka's advanced statistical features make it the natural choice for scientific and engineering professionals, as well as financial analysts and business managers.

Eureka - scsi::HD4.$.NewEureka.Sheets.budget1

Normal | Ready | NUM

I22 =SUM(ACS_Miscellaneous)

scsi::HD4.$.NewEureka.Sheets.budget1

				Budget				
				Qtr1	Qtr2	Qtr3	Qtr4	Total
NIH	Personnel	Total		£28,000.00	£29,000.00	£29,000.00	£29,000.00	£115,000.00
	Travel			£5,000.00	£5,000.00	£5,000.00	£5,000.00	£20,000.00
	Supplies	Chemicals	Total	£1,000.00	£1,400.00	£1,500.00	£1,500.00	£5,400.00
		Glassware		£1,000.00	£1,000.00	£1,000.00	£1,000.00	£4,000.00
		Lab Equipment		£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
		Office Supplies		£500.00	£500.00	£500.00	£500.00	£2,000.00
		Total		£4,500.00	£3,900.00	£4,000.00	£4,000.00	£16,400.00
	Large Equipment	Total		£158,500.00	£185,000.00	£60,000.00	£37,000.00	£440,500.00
	Miscellaneous	Total		£2,000.00	£2,000.00	£2,250.00	£2,500.00	£8,750.00
	Total			£202,500.00	£228,800.00	£104,250.00	£81,500.00	£617,050.00
ACS	Personnel	Total		£15,000.00	£15,000.00	£15,000.00	£15,000.00	£60,000.00
	Travel			£3,000.00	£3,000.00	£3,000.00	£3,000.00	£12,000.00
	Supplies	Plastics		£3,000.00	£3,000.00	£3,000.00	£3,000.00	£12,000.00
		Special Equipment		£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
		Office Supplies		£500.00	£500.00	£500.00	£500.00	£2,000.00
		Total		£5,500.00	£4,500.00	£4,500.00	£4,500.00	£19,000.00
	Large Equipment	Accelerator		£150,000.00	£0.00	£0.00	£0.00	£150,000.00
	Miscellaneous	Total		£800.00	£800.00	£800.00	£800.00	£3,200.00
	Total			£179,800.00	£27,800.00	£27,800.00	£27,800.00	£263,200.00

Build and maintain budgets with speed and accuracy. Using Eureka's powerful range naming features ensures you can always remember what your formulae mean, even months later!

POWERFUL, RELIABLE AND FULLY-FEATURED

Eureka brings the power and innovative features of the very latest in easy-to-use spreadsheet technology to all RISC OS users.

- Fully integrated charting and graphing, including line, scatter, bar, stacked bar, pie and area.
- Powerful worksheet formatting with styles, including cell shading, cell borders with different colours and weights.
- Picture-style number and text formatting allows full customising of value display.
- Multiple worksheets with file linking.
- Import and export of data: supports DIF, Text, CSV and 123 formats.
- Allows user-defined functions and function macros.
- Linear and multiple regression analysis.

Eureka is priced at £119 + VAT. For any Acorn computer running RISC OS with 2Mb of RAM or more. Proposed publication: October 1992.

***Eureka* contains over 150 built-in functions:**

Trigonometry
PI SIN COS
TAN ASIN
ACOS ATAN
SINH COSH
TANH ASINH
ACOSH
ATANH
RADIANS
DEGREES
ATAN2

Information
NA ISNA
ISBLANK
ISLOGICAL
ISREF ISERR
ISERROR
ISNONTEXT
ISNUMBER
ISTEXT N T
TYPE
ERROR.TYPE
ROW
COLUMN
ROWS
COLUMNS

Statistical
PERMUT
COMBIN SUM
MAX MIN
AVERAGE
COUNT
COUNTA
AVEDEV
MEDIAN
MODE RANGE
IQRANGE
QUARTILE
LARGE SMALL
STDEV STDEVP
VAR VARP
GEOMEAN
HARMEAN
NRAND SLOPE
INTERCEPT
CORREL
COVAR LINEST
LOGEST
TREND
GROWTH

Mathematical
RAND ABS
INT SIGN EXP
LN LOG10
SQRT FACT
FRACTION
EVEN ODD
LOG MOD
ROUND
TRUNC
CEILING
FLOOR
RANDBETWEEN
PRODUCT
SUMSQ
SUMX2PY2
SUMX2MY2
SUMXMY2

Matrix
TRANSPOSE
MDETERM
MINVERSE
MMULT

Logical
FALSE TRUE IF
AND OR NOT

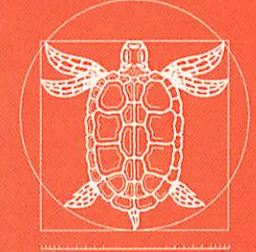
Time
NOW TODAY
DAYS360 DAY
HOUR MINUTE
MONTH
SECOND
WEEKDAY
YEAR DAYS
DATE TIME

String
CHAR FIXED
DOLLAR
CLEAN CODE
LEN LOWER
TRIM UPPER
PROPER
DATEVALUE
TIMEVALUE
VALUE RIGHT
EXACT LEFT
REPT TEXT
FIND SEARCH
MID REPLACE
SUBSTITUTE

Financial
PV FV PMT
NPER RATE
IPMT PPMT
VDB DB DDB
SLN SYD NPV
IRR MIRR

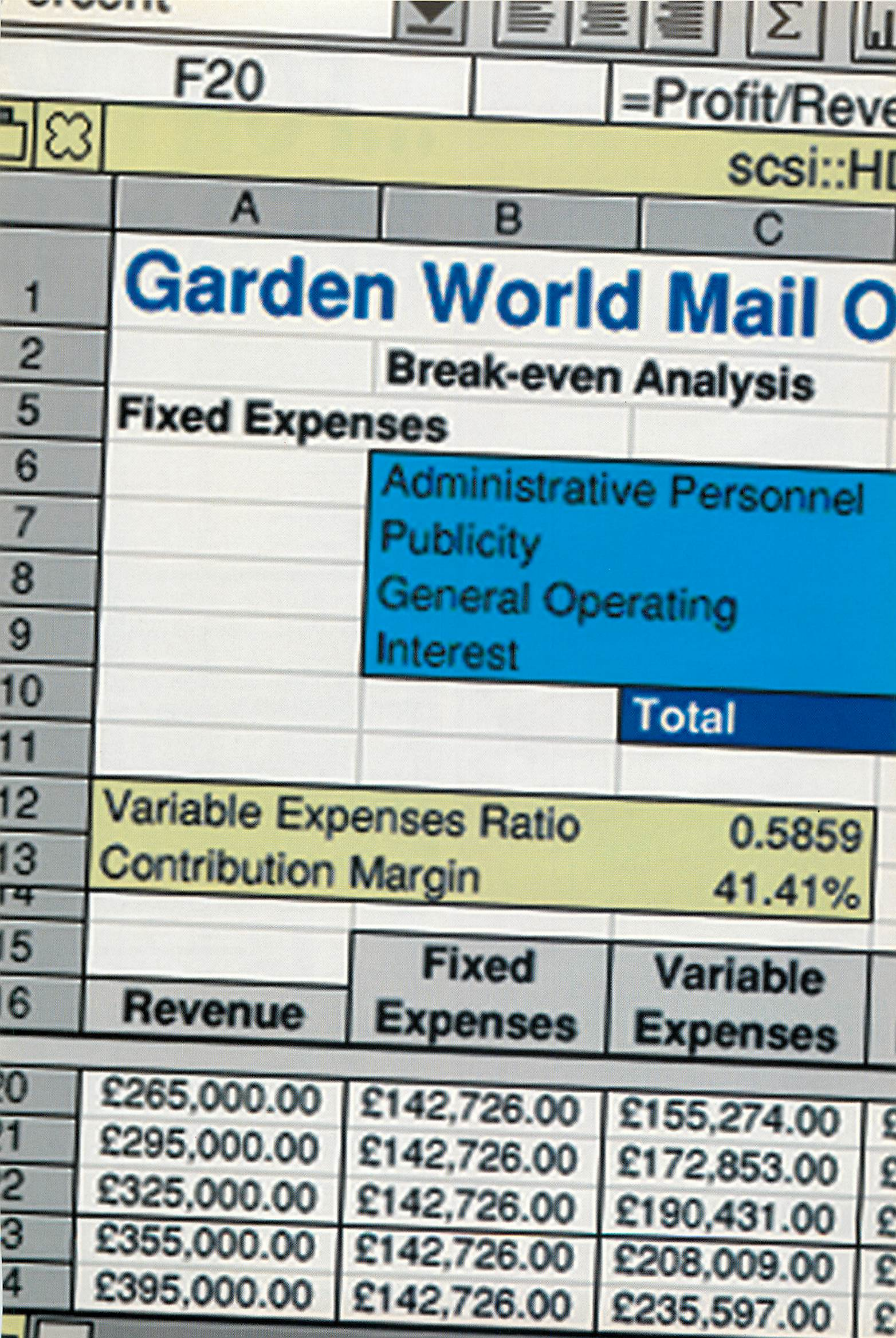
Lookup
CHOOSE
INDEX
HLOOKUP
VLOOKUP
LOOKUP
MATCH

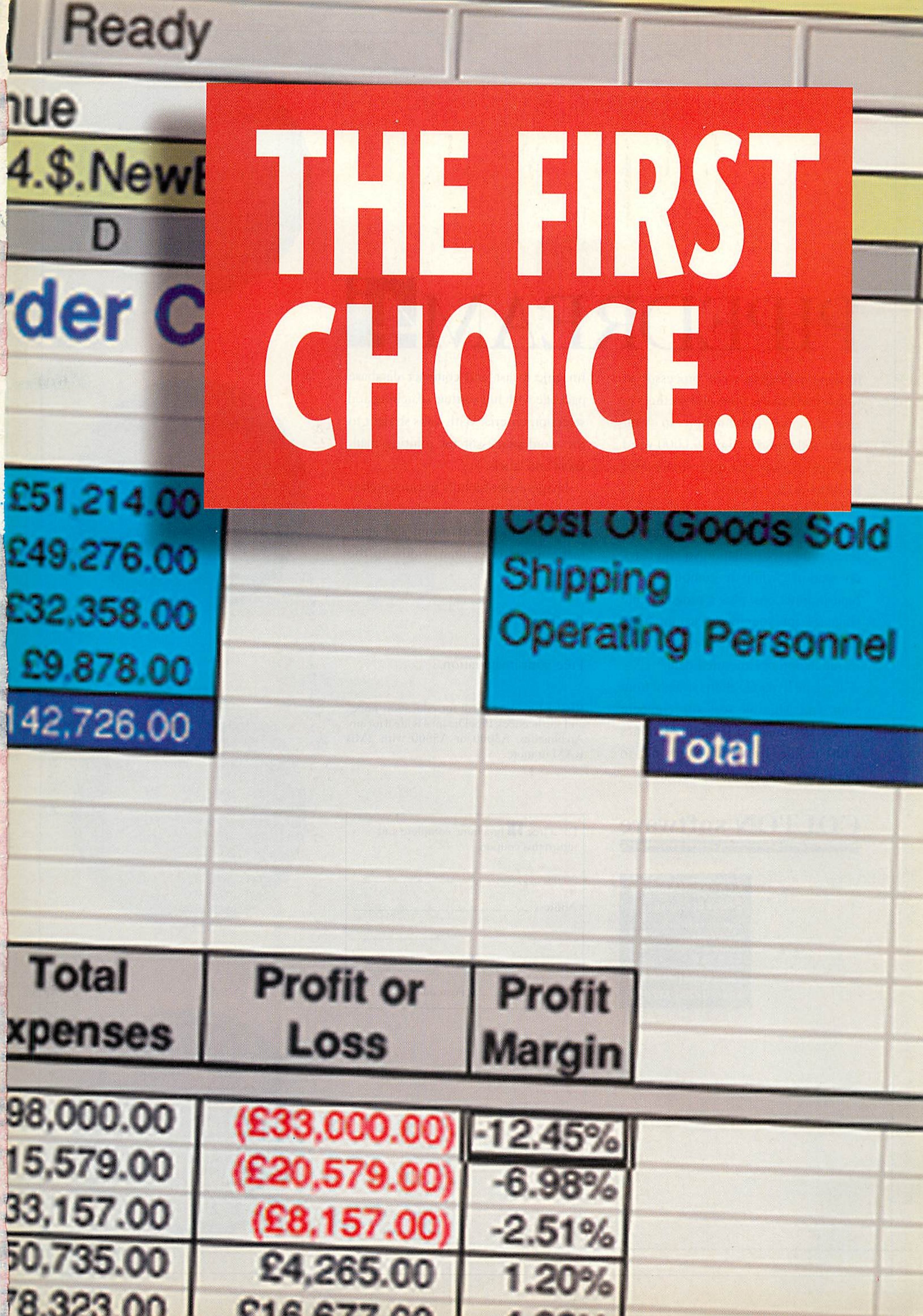
Miscellaneous
REVERSE



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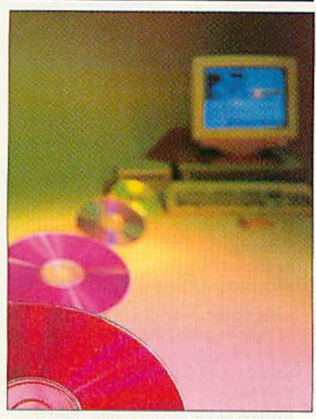
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F20
=Profit/Reve
scsi::HI
A
B
C
Garden World Mail O
Break-even Analysis
Fixed Expenses
Administrative Personnel
Publicity
General Operating
Interest
Total
Variable Expenses Ratio
0.5859
Contribution Margin
41.41%
Revenue
Fixed Expenses
Variable Expenses
£265,000.00
£142,726.00
£155,274.00
£295,000.00
£142,726.00
£172,853.00
£325,000.00
£142,726.00
£190,431.00
£355,000.00
£142,726.00
£208,009.00
£395,000.00
£142,726.00
£235,597.00



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Shipping
Operating Personnel
Total
£51,214.00
£49,276.00
£32,358.00
£9,878.00
142,726.00
Profit or Loss
Profit Margin
(£33,000.00)
(£20,579.00)
(£8,157.00)
£4,265.00
-12.45%
-6.98%
-2.51%
1.20%

NOVEMBER 1992
ISSUE 124



COVER PHOTOGRAPHY
ROBERT CLIFFORD

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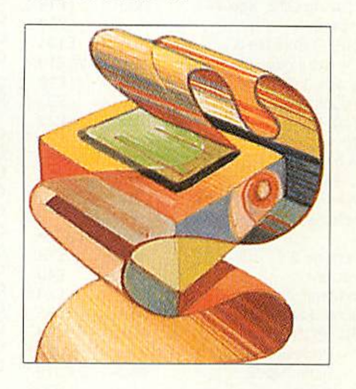
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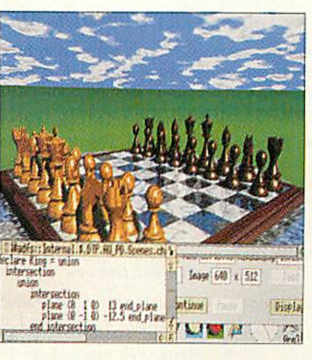
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ICS

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24 SEPTEMBER 1992

SOFTWARE

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10 out of 10 Maths (Number)	Triple R	£20•
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Manchester United Football Club	Krisalis	£19
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Nevryon	Fourth Dim	£16
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Pipe Mania	Empire	£18
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PIPP2 Professional Integrated Project Planner		
– 5-14 Programme	CIS	£85
– Middle	CIS	£52
– Primary	CIS	£44
– Primary: Homes	CIS	£12
– Resource Centre	CIS	£129
– Secondary	CIS	£69
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– site licence		£30
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– WordProc	Circle	£25
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PrimeArt	Minerva	**£49**
PrimeWord	Minerva	£55
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– BJ10ex TurboDriver + Cable	CC	£42
– BJC800 TurboDriver + Cable	CC	£98
– CA (Canon PW1080A)	Ace	£15
– CC (ColourCel)	Ace	£15
– Deskjet 500C	RISC	£15
– Epson, Star colour	RISC	£15
– HP (HP Colour)	Ace	£15
– JX (Epson, Star and Citizen colour)	Ace	£15
Pro Artisan	Clares	£70
ProCAD	Minerva	£POA
Programming in ANSI Standard C on the Archimedes	Sigma	vo £17•
Prophet (requires 2 Mb)	Apricote	£134
Prophet Demo	Apricote	£10
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Provocator	Computer Tutorial	£15
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Puncman 5 to 7	Chalksoft	£17
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– site licence		£45
Real McCoy	Fourth Dim	£24
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Render Bender II	Clares	£85
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Repton 3	Superior	£14
Revelation 1	Longman	£54
Revelation 2	Longman	£95
– CD Rom	Longman	£123
Reversals	Chalksoft	£17
Rhapsody 2	Clares	£45
RiscBASIC Compiler	Silicon	£79•
RiscForth Compiler	Silicon	£79•
Risc OS Companion Vol 1	Oak	vo £49
Risc OS Extras 1992	Acorn	£9
Risc OS Programmer's Reference Manual	Acorn	vo £79
Risc OS Style Guide	Acorn	vo £11
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Saloon Cars Deluxe	Fourth Dim	£27
– Deluxe Extra Courses	Fourth Dim	£16
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Scorewriter	EMR	
– PMS Dot matrix, Version 1		£127
– PMS Dot matrix, Version 2		£147
– PMS PostScript		£422
ScreenPlay	Widgit	£35
Screen Turtle	Topologika	£37
Search and Rescue, age 9+	Storm	£27
Seashore Guide, drawfiles	Micro Studio	£16
Sesame Street	Electric Crayon	
– Letters for You		£16
– Numbers Count		£16
SFXM	CIS	£32
ShapeFX	Data Store	£10
ShareHolder	Silicon	£106
ShareHolder Professional	Silicon	£234
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Shylock Gnomes, age 10-15	Selective	£19
Sim City	Krisalis	£19•
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smArt Aliens / Animals / Dinosaurs / Faces / Faces (French) / Faces (German) / Fashion / Heraldry / Homes / Homes (French) / Homes (German) / Leisure / Leisure (French) / Leisure (German) / Look Smart / Smartoons / Trees and Gardens – each	4mation	£15
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SolidsRender	Silicon	£79•
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SparkFS	David Pilling	£20
Sparkle	Morley	£59
Special	ICS	£10
– site licence		£30
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Spelling week-by-week	Chalksoft	£22
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Sporting Triangles	CDS	£20
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Superior Golf	Superior	£14
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Swiv	Krisalis	£19
System Delta Plus II	Minerva	£50
– Reference Guide	Minerva	vo £25
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Tower of Babel	Cygnus	£17
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Utility Disc 2	Data Store	£13
Utility Disc 3	Data Store	£7
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– Arc/Mac Cable	Human	£24
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WorraCAD	Oak	£83
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Zelanites (not OS 3)	Micro Power	£16

HARDWARE



Please ask for details of combinations not listed here

A3010 1MB FD Family Solution	Acorn	£420
A3010 1MB HD20 (as above + *ideA'92* Hard Disc)	Acorn/ICS	**£599**
A3010 2MB FD Learning Curve with Monitor	Acorn	£675
– as above + JP150 Printer		£889
A3020 2MB FD	Acorn	£749
A3020 2MB HD60	Acorn	£899
A4 2MB FD	Acorn	£1395
A4 4MB HD60 with free PC Emulator 1.8	Acorn	£1695
A4 4MB HD80/120	Acorn	£POA
A4 Extra Battery Pack	Acorn	£50
A4 Shoulder Bag	Acorn	£35
A4000 2MB HD80	Acorn	£945
– as above + Home Office		£995
A5000 2MB HD80 Multiscan	Acorn	£1395
– as above + Learning Curve		£1455
Pocket Book	Acorn	£212

MEMORY

Fitting extra unless otherwise stated
† Fitting easy ‡ Fitting needs expertise

A3000 2 Mb Non-upgradable †	IFEL	£55
A3000 2 Mb Upgradable †	IFEL	£63
A3000 4 Mb †	Atomwide/IFEL	£140
A3010 1-2 Mb		£49•
A310 2 Mb Upgradable soldered ‡	IFEL	£99
– as above + MEMC1a		£149
– as above + MEMC1a + fitting		£200
A310 4 Mb soldered + MEMC1a ‡	IFEL	£225
– as above + fitting		£277
– as above + fitting + OS3 carriers		£298
A5000 2-4 Mb Non-upgradable†	Atomwide	£85
A5000 2-4 Mb Upgradable †	Atomwide	£109
A5000 2-8 Mb including fitting	Atomwide	£500
A5000 4-8 Mb including fitting	Atomwide	£391
A540 4 Mb †	Atomwide	£238

MISCELLANEOUS

386C PC Expansion Card	Aleph One	
– 1 Mb		£463
– 4 Mb		£579
4-slot 4-layer Backplane	IFEL	£59
9060S Monitor	Eizo	£450
A300/400 Fan kit	ICS	£15
A310 RISC OS Carrier Board ‡	IFEL	£21•
A5000 Fitting Kit for second hard disc	ICS	£15
Arckey Function KeyStrip Holder	ICS	vo £3
– pack of 4		vo £10
ARM3 ‡	Aleph One	£189
Dongle Dangle with screw fittings	ICS	£6
Fan filters (pack of 10) (not A5000)	ICS	£6
FaxPack	CC	£289
Floppy Discs, 10 × 3½" High Density		£10
HiPoint Mouse for A4	Genius	£49•
Micro Mouse	Clares	£26
Monitor Stand for A3000	ICS	£21
Podule Case for A3000		£16
RISC OS 3 Upgrade	Acorn	£41•
– Bulk package	Acorn	£335•
– A5000	Acorn	£17•
Seal 'n Type spill-proof Keyboard Covers		
– Archimedes / A5000	Kador	£14
– A3000	Kador	£14
TouchWindow	Lindis	£234
Whisper Fan Quietener (for A300/A400 series only)	ICS	£15



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ArcLaser 300-6	Calligraph	£895
ArcServer 300-8	Calligraph	£985
Bubble Jet BJ-10ex	Canon	£187
Bubble Jet BJ-10ex + TurboDriver	Canon/CC	£229
Bubble Jet BJ-20	Canon	£255•
Bubble Jet BJ-300	Canon	£299
Bubble Jet BJ-330	Canon	£405
Bubble Jet BJC-800 + TurboDriver	Canon/CC	**£1499**
DeskJet 500C	Hewlett-Packard	£429•
Laser Direct HiRes4 with 50-sheet tray	CC	£899•
– 250-sheet Paper Cassette		£99
Laser Direct HiRes8	CC	£1280
Laser Direct LBP-4 Card	CC	£325
LBP-4	Canon	£659
Refill toner cartridge for Canon EPS		£50
New toner cartridge for Canon LBP-4		£59

SCANNERS, DIGITISERS

ArcScanner including Epson GT-4000	Clares	£1660
FaxScan	Spacetech	£94
Hawk V9	Wild Vision	£199
– A3000 version	Wild Vision	£278
iMage (Sharp JX-100)	Irlam	
– for A5000		£490
– for other computers		£589
Image Scanner	Iota	£383
– Colour upgrade	Iota	£148
– Fast parallel card	Iota	£98
– Lighting unit	Iota	£91
i-Scan 200	Irlam	£539
i-Scan 400	Irlam	£589
Pineapple Colour Video Digitiser	Pineapple	£195
– A3000 boxed	Pineapple	£230
ProImage (Epson GT6000)	Irlam	
– for A5000		£989
– for other computers		£1089
Scan-Light A4	CC	£277
– with Sheet Feeder	CC	£360
Scan-Light 256	CC	£190
– A3000 internal	CC	£190
Scan-Light Professional	CC	£565
– as above + SCSI interface	CC	£699
SnapShot Colour Video Digitiser	Lingenuity	£195
– A3000 version	Lingenuity	£275
Spectra	RISC	£545
– A3000 Internal	RISC	£545
– A3000 External	RISC	£565
Vision Digitiser	HCCS	
– Mono		£47•
– Colour		£79
– A3000 External Mono		£62
– A3000 External Colour		£92
– A3000 Internal Mono		£49
– A3000 Internal Colour		£79

I²C PRODUCTS

AnDi Oddule	Baildon	**£30**
I²C Adaptor (needed unless you already have an I²C socket)	Baildon	£10
I²C SWI (enhanced IIC_Control)	Baildon	£15
– bought with Oddule		£5



and at THE BETT SHOW OLYMPIA 20th–23rd JANUARY

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ideA'92 is the name of a new generation of IDE interface cards from ICS, fully compatible with RISC OS 2, 3 and 3.1. Unlike other makes, Internal Hard Disc Upgrades from ICS will fit neatly inside the new A3000 Series computers.

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*These are different products – please specify which you require	60 Mb	£349
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	120 Mb	£549
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	200 Mb	£499
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A very special offer from ICS!

A3010 'Family Solution' + 20 Mb Hard Disc	£599
As above with 2 Mb ram	£645

ICS has always led the field in IDE systems for Acorn computers. You can buy our products with confidence, either direct from us or from any Acorn dealer who values quality as well as price. The above examples of our range are all available as this goes to press, and include all the *ideA'92* features. External options are also available, but may not yet include all the features described. Please contact us for the latest information.

Prices are for complete upgrade kits and exclude VAT. Carriage is free on UK prepaid orders.

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IMPORTANT NOTICE If you have version 2.5x of our IDEFS, please telephone 0274 580519 for some important news. To see which version you have, type Help IDEFS at the command line. If it starts with 2.5, call us now.



MEZZANINE BOARD IN A3010

SURPRISED owners have been finding their brand new A3010 computers don't have the much-heralded new Arm250 chips inside. Instead there is a neat and compact 'piggy-back' board featuring the four main Arm family chips which are combined into one chip on the Arm250. Acorn calls it the 'Mezzanine' board and it has been fitted to the first thousand or so A3010 motherboards instead of the Arm250.



The new A3010 – early models feature the Mezzanine board

It appears that Acorn decided to hedge its bets by producing the board – which is functionally identical to the Arm250 – just in case the first production Arm250s arrived late. 'It was essential to get a certain number of A3010s into places like Dixons on time,' said Acorn's Brian Salter. Arm Ltd's Jamie Urquhart denied that any serious delays were experienced during the Arm250's development. He also added that the Mezzanine was a useful part of the Arm250 design process. Owners of machines fitted with Mezzanine boards have no need to replace them with real Arm250 chips.

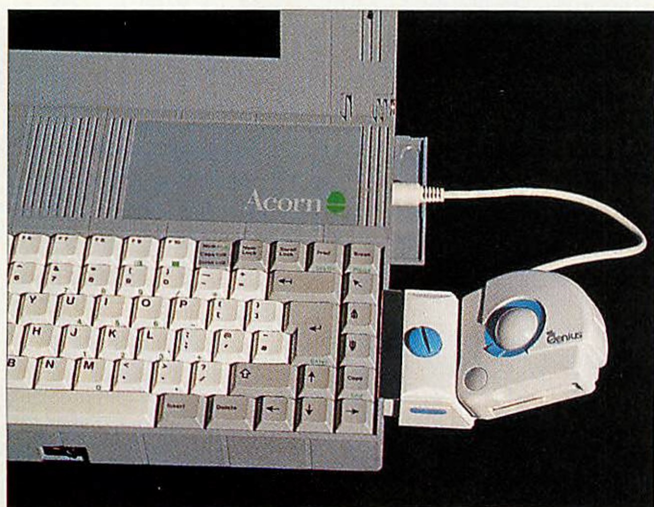
Incidentally, Arm Ltd is seeking customers outside of Acorn for the Arm250.

KEEP TRACK WITH A4

FRUSTRATED Acorn A4 notebook mouse users are being targetted by Atomwide with a compact trackerball unit developed for the machine.

With a notebook computer often there isn't a suitable flat surface for the mouse to run about on. Atomwide has take the Genius Hi-Point Trackerball, which is popular among IBM-compatible notebook PC users and made it compatible with the A4's standard mouse connector. Clips are provided to attach the unit to the A4 case while in use and a carry case is also supplied.

Atomwide points out that, unlike some of its rivals, no ports which may be needed for other peripherals are used. Atomwide has priced the A4 trackerball at £49.95 plus VAT. Contact Atomwide on (0689) 838852.



Easy tracking on the A4 with Atomwide's new trackerball unit

RISC OS 3 RECALL?

A HUGE demand for Risc Os 3.10 upgrade packs has left dealers and customers frustrated because of limited supplies. Acorn is not saying so officially, but *BAU's* contacts in the trade have indicated that a large initial consignment of upgrades has had to be recalled because a Rom fitting diagram in the installation instructions was incorrect.

The diagram apparently contradicts the correct written instructions. If you follow the diagram, the Roms can be fitted the wrong way round which could result in damage. It is not clear whether all of the initial 10,000 upgrade consignment required modified instructions.

As *BAU* went to press, Risc Os shipments to dealers were due in about a week, although most of these were already spoken for.

Hopefully there will not be a shortage of upgrades at the *BAU* Show.

NEWS IN BRIEF

● HCCS has produced the modestly titled 'Ultimate Expansion System' for the new A3010, A3020 and A4000 Acorn computers. These new Acorn models only have one internal mini-podule expansion slot. Fit a hard disc to the A3010 and there is no further expansion space. The HCCS system uses a multi-podule device which itself plugs into the computer's single mini podule slot. The multi-podule accepts up to three credit-card sized 'micro podule' peripherals. HCCS is working on four micro podule peripherals due for release by the end of October; a version of the HCCS Vision colour digitiser, a SCSI controller, analogue port and a serial interface. Different versions of the Ultimate Expansion System base multi-podule unit are required for each different computer and the A3020 and A4000 versions have a User Port as standard. All versions are priced £33 plus VAT. The A3010 version is optionally available with a 30Mb IDE hard disc for £269 plus VAT. An external PSU may be necessary for some installations.

● Meanwhile, if you want to caught with a star athlete at the *BBC Acorn User* Show, watch out for the HCCS colour digitiser on the Acorn stand. You will get a free disc with the captured image of you and a star name and be entered for special draw to get your money back if you buy a digitiser. Contact HCCS on 091-487 0760.

● The user club for Archimedes users, Club A3000, has changed its name to The Arm Club. It has an open day on November 15 at Mill Hill School in North London. For more information contact Simon Burrows on (0533) 712030 or on the Arcade BB.

● Recently we asked if any Polish-speaking readers could translate a caption to a Dennis the Menace lookalike cartoon featured in an Archimedes produced education newsletter from Poland. Alex Daly from Glasgow duly provided the translation: "Do you have something for me to do?" Thanks Alex.

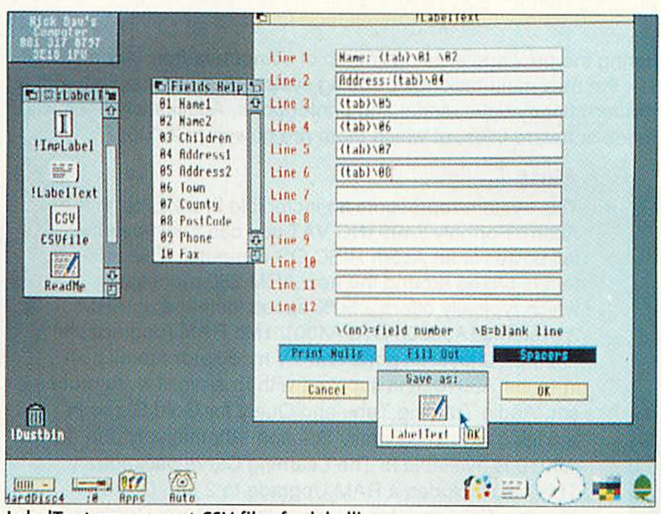
CAN'T WAIT TO TELL 'ER INDOORS!

ARTHUR Daley of ITV's *Minder* series might stash the odd PC in his lock-up, but if an Archimedes happens to 'fall of the back of a lorry', there is one copper who will be more than a bit interested in it.

Actor Nicholas Day, who plays Sergeant Morley in the popular series, is a keen Archimedes user and has just written *LabelText*, a Risc Os application for converting database CSV files for label printing.

So how was it that this television actor became converted to programming for the Arc? 'Obviously there are periods between jobs when actors have time on their hands and computing is a useful way of filling that time. But, in fact, I've been using home computers quite seriously since the original Sinclair ZX80 first came out years ago,' Nicholas told *BAU*. After the ZX80 came a BBC Model B, followed by a BBC Master. In his Beeb days Nicholas had a couple of card games published by Beebug and a disc indexing program by Clares. Later he moved on to a BBC A3000 and eventually an Archimedes A440/1, which he uses today. Has he ever thought of changing to a PC? 'Never! I have loads of friends with PCs and they can't do half the things I can with my Archimedes.'


Sergeant Morley, aka Nicholas Day



LabelText can convert CSV files for labelling

Nicholas is a great fan of Computer Concepts' *Impression* DTP software, which he uses for producing the local parish magazine and writing scripts. Recently he used *Draw* to design a logo for his new play, *Flesh and Blood.*

Nicholas was surprised to find himself delving into the world of Risc Os desktop programming: 'When the A3000 arrived, I was convinced my programming days were over, but I have to say I was very pleased with the way LabelText turned out.'

He hasn't decided whether to market his program, but if anybody is interested, contact *BAU*.

NEW IDE HARD DRIVES FOR A3010

RISC Developments has produced a range of internal IDE hard drive cards designed specifically for the new Acorn A3010. The hard card is available in 20, 60 and 85Mb capacities.

Risc Developments' David Spencer says a card can be fitted by most people in under ten minutes using comprehensive and easy-to-follow fitting instructions supplied.

New firmware makes the drive appear as an ADFS hard drive and ensures 100 percent compatibility with ADFS software.

Alternatively, the latest version of Risc Developments' IDEFS software, which now includes read-only partitioning, is available as an optional extra costing £14.95.

Pricing is as follows: 20Mb £199; 60Mb, £349; and 85Mb, £479 (all prices plus VAT).

● An enhanced version of *DeskEdit*, the text editor for programmers, has also been released by Risc Developments. New features include a global and partial Basic program renumber function, customisable listing indenter and a programmer's calculator with an import/export facility. There are also extensive save status options, Acorn's Find tool and keyword help. In fact, there are too many other changes to list here.

DeskEdit 2 is priced £31.95 and *DeskEdit 1* users can upgrade for £9.95 by returning their original discs. For a review of the original version of *DeskEdit* turn to the February issue of *BAU*.

● A new version of Risc Developments' *ChartWell* graphs and charts package, version 1.1, has been released. Improvements include representation of negative data, more flexible handling of data limits, better label positioning options plus some bug-fixes. Price remains at £29.95.

● *Wimp Programming for All* is a new book published by Risc Developments. Written by Lee Calcraft and Alan Wrigley, the book provides a comprehensive introduction to Risc OS desktop programming. It costs £12.95 and an accompanying applications disc is also available for £4.95.

For further information, contact Risc Developments on (0727) 40303.

NEWS IN BRIEF

● *Wordz*, a new page-based WYSIWYG word processor with graphical capabilities, has joined the Colton Software stable alongside the popular *Pipedream.*

Colton is making some ambitious claims for *Wordz*, saying the new package will 'change the way many people will use their Archimedes'. *Wordz* will be priced at around £100 and has been designed with ease of use as the main objective, especially for first-time users. However, *Wordz* is said to be no stripped down letter writer: 'There are plenty of powerful features in there,' said Colton Software's Rob MacMillan. Beyond that, Colton has remained tight-lipped about its new baby, preferring to reveal all at the *BBC Acorn User* Show.

Two new books for *Pipedream* users are also available. *Getting Started with Pipedream 4*, priced £4.95, was compiled by The Institute of Education and the The Advisory Unit at Hatfield. Colton Software itself has published the second book, *A Teacher's Introduction to Spreadsheets Using Pipedream 4*, written by David Hassle, priced £3.95. Both books are available directly from Colton Software. Tel: (0223) 311881.

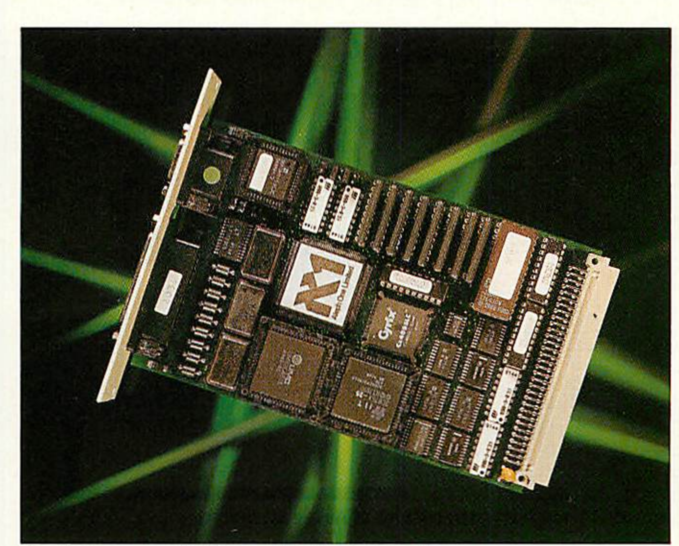
● Design Concept has released a selection of new outline fonts for Risc OS. Each font has been designed from scratch and will be unique to Acorn machines. Examples include Matrix35, which looks rather like a 5x7 dot matrix LED or a dot matrix printer font. Mairo is a classic two-tone serif font, while Scrawl is a pleasant flowing font which resembles a felt-tip freehand. Most fonts are available in various family member guises like medium, oblique, bold, etc. The first font in each family costs £4 with subsequent ones at £3 each. Contact Roger Spooner on 031-668 2000.

● Last month's review of 256-grey scale hand scanners wrongly assumed that the Watford Electronics scanner podule was limited to the scanner head reviewed. Watford Electronics has since told us that the same podule will be driving a new A4 scanner unit and it is possible a colour scanner will make up a trio of different scanners compatible with the one card. More details as soon as Watford finalise them.

486 PC CARD FOR PRICE OF A 386

ALEPH One has been busy enhancing its Archimedes PC cards. A 486 version is now available for the price of the original 386SX version, which itself has been reduced by £100 despite a speed enhancement from 20MHz to 25MHz. *Microsoft Windows* graphical performance has been dramatically improved by the introduction of dedicated *Windows* graphics drivers.

The new 486 card uses a 25MHz Cyrix 486SLC, which is pin-compatible with the 386SX chip. Performance is roughly twice that of the 386 version and has about 40 percent of the performance of a standard 33MHz 486DX PC clone. However, the apparent performance of the card is much enhanced by the new *Windows* driver software. This time the 386 card's graphical performance under *Windows* exceeds that of the 486 clone PC – in effect, the Archimedes behaves as if it is a *Windows* accelerator. According to Aleph One's Alex Van Sommeren, before the *Windows* driver was completed, one particular graphics bench test could be measured quite easily on a stop watch, but not any more.



Aleph One's new 486SLC card for the Archimedes

While the Cyrix 486SLC doesn't have a maths co-processor built in, the Aleph One card retains its separate maths co-processor socket for users who need faster floating point arithmetic performance.

The 500-plus existing users of Aleph One's original 386SX PC card will be offered the new *Windows* driver software free of charge. It will be offered as an optional extra to new users for £25. The 486SLC card is priced £495, while the enhanced 386SX card is reduced from £495 to £395 (all prices plus VAT).

Aleph One has further reduced the price of its Arm3 upgrade from £199 to £175 plus VAT. In addition, there is a special offer comprising an Arm3 upgrade and Risc OS 3.10 for £199 plus VAT.

For further information, contact Aleph One on (0223) 811679.

ARTWORKS FONTS

COMPUTER Concepts has announced a surprise deal to supply over 200 new Acorn-compatible outline fonts with its new *ArtWorks* drawing package.

ArtWorks 1.00 has finally started shipping after 10 man-years of development. Computer Concepts claims that in tests using an Acorn A5000, *ArtWorks* updates the screen five times faster than the leading PC drawing package, *CorelDraw*, running on an IBM PC clone fitted with a super-fast 50MHz 486DX processor. The same test saw the A5000 comfortably faster than a top-of-the-range Apple Mac Quadra.

The new fonts were sourced by Computer Concepts from the USA and consist mainly of display and headline faces, which is precisely what you need for a drawing package. For £169 plus VAT, purchasers of the package receive: a 200-page colour manual; a colour publishing guide; a font listing guide; the *ArtWorks* applications discs; and no less than 14 font and clip art discs. Computer Concepts' managing director, Charles Moir, described *ArtWorks* as the best program his company has produced yet and it can be seen at the *BBC Acorn User* Show.

● A lesser known feature of the chip-set used in Computer Concepts' *Fax Pack* will soon be available to users via a software upgrade. This will enable a *Fax Pack* to not only send and receive faxes, but voice messages as well. In other words, *Fax Pack* will have a secondary role as an answering machine.

For further information, contact Computer Concepts on (0442) 63933.

COMPLIER READY

SILICON Vision has announced version 3 of its BBC Basic V compiler, RiscBASIC. The new release is faster and more robust than the previous version, release 2.06. The Desktop Developer's Environment is integral to the RiscBASIC environment and *Edit* program text files can be dragged and dropped straight onto the RiscBASIC icon, with any syntax errors highlighted in an *Edit* window. The user is also able to swap between the command line and desktop without needing to reconfigure the compiler.

RiscBASIC 3 is priced at £99.95. Existing users with release 2.06 or earlier can upgrade for £55 or £30 if they have 2.06 with the DDE.

Contact Silicon Vision on 081-427 5169.

NEWS IN BRIEF

● A new games Milton Keynes-based software house dedicated to flight simulations has been formed by Andrew J Gray and M D Rowlson. The surprise name for the new company is AJG & MDR Software.

The Archimedes is, in theory, ideal for flight simulation programs, and, with a few exceptions, this abundant potential hasn't yet been fully exploited. The guys behind AJG and MDR say they have a vast experience in 3D modelling techniques and they aim to make full use of the Simis Flight Simulation Toolkit. Forthcoming projects will have very detailed graphics including pseudo-fractal generate mountain scenery. AJG & MDR can be contacted on (0908) 565137.

● Two new additions to the Panasonic QuietPrinter dot matrix range have been made. The KX-P2180M and the 24-pin KX-P2123M cost £225 plus VAT. An optional kit for colour printing is available for £45 plus VAT. Panasonic claims its QuietPrinters are less noisy than some inkjets. Contact Panasonic on (0344) 853551.

● TDK has done a deal with Acorn to supply green floppy discs in Acorn consumer bundles during the run up to Christmas. Customers will also get the option of buying two five-packs of TDK coloured floppy discs and getting one free. An added incentive is that 20 Acorn A4 notebooks are up for grabs in a joint TDK and Acorn promotion.

● Philips has dropped the price of its CM8833/II RGB colour monitor from a recommended price of £229.99 to £199.99. This standard resolution monitor is aimed primarily at Atari ST and Commodore Amiga users but looks ideal for the new Acorn A3010 home computer. Stereo speakers are included and the one year guarantee includes an on-site maintenance deal. Contact Philips on 081-689 4444.

● A new Acorn dealership has been established in Fife, Scotland. Liquid Silicon can be contacted by telephone on (0592) 260512, or you can write to Liquid Silicon, FREEPOST EH2725, Kirkcaldy, Fife, KY2 5BR.

ACORN UNVEILS DOWN UNDER

TWENTY companies selling their Acorn products in Australia and over 150 dealers and customers recently met at a special conference in Melbourne.

4Mation's Mike Matson was the keynote speaker and Acorn's managing director, Sam Wauchope, was there to unveil the new A4 notebook. The three-day National ACE '92 computer conference and exhibition followed. Many attendees were impressed with the demonstration of Acorn Replay, which stopped more than a few Apple QuickTime fans in their tracks.



Acorn's A4 notebook attracts a lot of Aussie attention

WATFORD IN LUTON!

WATFORD Electronics recently celebrated the opening of its impressive new purpose-built, 37,000 sq ft headquarters in Luton with an open day featuring Acorn's newly launched computers.

Over 1600 people visited the new showroom despite inclement weather. A 150-person capacity seminar room was used for educational and special needs demonstrations. Managing director Nazir Jessa told *BAU* that he expects to announce details of a second open day in Luton for before Christmas. Although Watford Electronics' HQ is now in Luton, Nazir Jessa said the Watford name is here to stay and he stressed that the original Jessa House building in Watford High Street will be retained for the foreseeable future.



The new Acorn A3010 attracted younger visitors to the Watford open day

UPGRADE FOR FPA

SIMTEC Electronics has produced an Arm3 upgrade with a chip socket ready for the long-awaited Floating Point Accelerator (FPA) from Arm Ltd. Although Acorn's latest top-of-the-range computers, the A5000 and A540, have FPA sockets as standard, thousands of A300 and A400-series Archimedes, as well as the original A3000, are not designed to take the FPA chip. Despite the extra complexity of the card, which uses the latest surface-mount fabrication, Simtec has priced the upgrade very competitively at £175 plus VAT. The card is supplied with fitting instructions and PLCC chip extraction tool though A3000 users will require a fitting service.

Simtec's A3000 4Mb upgrade is now £106 and the A5000 version is £79. Contact Simtec Electronics on (0772) 812863.

CHEAPER COLOUR DOT MATRIX

STAR Micronics has announced what it claims is the cheapest colour dot-matrix printer on the market. The nine-pin LC-100 Colour has a recommended price of £219 plus VAT. Features include automatic selection of printer emulations, a push tractor feed with paper parking, eight NLQ fonts, electronic dip switches and print speeds of 180 characters per second in draft mode or 45cps in NLQ mode.

Another new printer from Star is the monochrome 24-pin LC24-100. Costing £239 plus VAT, the LC24-100 has a novel compressed data mode which Star says will increase print throughput from the computer by up to 25 percent.

Existing Star printers have also been reduced in price. The LC-20 entry-level nine-pin monochrome dot-matrix has been reduced to £189 plus VAT while the StarJet SJ-48, a re-badged Canon BJ10 bubblejet printer, is reduced to £345+VAT to £299 plus VAT. Contact Star Micronics on (0494) 471111.

NEWS IN BRIEF

● Naturally enough, most of the Acorn limelight these days shines on 32-bit happenings. However, there are still several hundred thousand eight-bit BBC Micros out there being used every day and, indeed, Acorn still sells the odd thousand or two per year.

Solinet, a self-help BBC Micro user group founded in 1986, is still actively seeking new members. For an information sheet send and sae to: Solinet, 41 Westbrook Drive, Rainworth, Mansfield, Notts NG21 0FB.

● A new public domain disc-based magazine for the Archimedes has been produced by a group of enthusiasts calling themselves Quantum Productions. The magazine is called *New Dawn* and further information can be obtained from: Cobra, 7 Jervaulx Close, Boston Spa, Wetherby LS23 6RY.

● *New Dawn* has some competition from another disc-based Archimedes magazine. *Lunchtime III* has just been completed and features an animated introduction sequence, 280K of music plus light-hearted editorials and graphics.

Lunchtime is available from Andrew Bennet, 203 London Road, Chesterton, Newcastle ST5 7HT.

● Datastream PD, which has a selection of 600 public domain discs for the Archimedes, has a new address: 34 Norbreck Close, Great Sankey, Warrington WA5 2SX.

● In last month's show preview pages we incorrectly stated that Orion Computers is a dealer in the West Midlands area. In fact, the company is a Lancashire dealer. Sorry about that. Orion can be contacted on (0772) 623000.

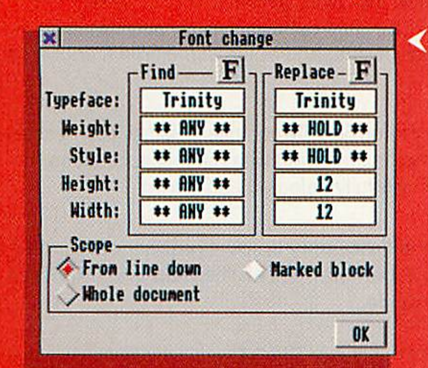
● There was an error in last month's Virus article. Gremlins decided to eat a couple of commas, and the line that checks for the presence of the T2 virus should read:

```
SYS "XOS_ServiceCall",,&COFFEE TO ,A%:PRINT A%.
```

Sorry for any incovenience this may have caused. Thank you to reader Keith Powell for writing in to point out our error.

MEET THE NEW ADDITION TO THE PENDOWN FAMILY

Longman Logotron introduces a brand new word processor, with all the ease of use of the famous PenDown and with powerful new features, including:



FONT FIND AND REPLACE for easy changing of any attributes of a font throughout the document.

TABLE EDITOR to create, reorganise and perform sum and percentage calculations on tables.

LABEL PRINTING on any kind of RISC OS supported printer.

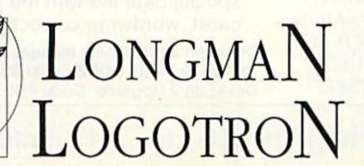


MASTER PAGES (single or double) and chapters, for creating headers and footers.

ALSO INCLUDES an outstanding new DICTIONARY with over 65,000 words and check-as-you-type facility; MAILMERGE with *!Mail*, a custom name and address database; FLEXIBLE PRINTING CONTROL with automatic booklet printing; CONTINUOUS SCROLLING DOCUMENTS so you don't have to turn pages; VISUAL RULER CONTROL with ruler copy and move; and all the other features which made PenDown easily the top selling word processor for schools.

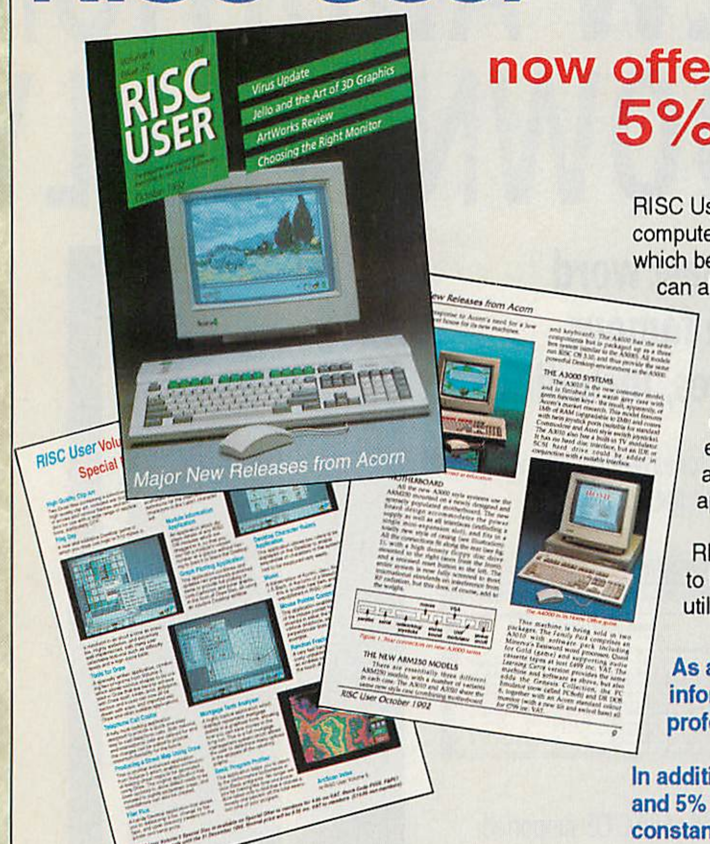
Archimedes PenDown Plus

RRP £79
Site Licence £400



124 Science Park
Milton Road
Cambridge CB4 4ZS
Tel (0223) 425558
Fax (0223) 425349

RISC *User*



now offers 15% off Software and 5% off Hardware to subscribers

RISC User is a high quality magazine devoted totally to the Archimedes range of computers. RISC User is produced by a dedicated and enthusiastic professional team which benefits from over 10 years of experience in computing and writing. RISC User can also call upon RISC Development's considerable expertise as a major software and hardware developer for the Archimedes range.

Every RISC User issue contains a wealth of articles and programs with professionally written reviews, lively news, help and advice for beginners and experienced users, and of course the usual game or item of home entertainment. Altogether RISC User has established a reputation for accurate, objective and informed articles, and at the same time friendly and approachable style.

RISC User is also famous for its professionally compiled disc, which in addition to the programs from the magazine, is crammed with useful applications, utilities and entertaining items, all carefully selected and tested.

As a RISC User subscriber you will not only enjoy a highly popular and informative magazine, but you will benefit from all the help and support a professional organisation can provide.

In addition you will receive at least 15% off any RISC Development's software and 5% off RISC Developments' hardware, and this list of products is constantly growing.

A year's subscription to RISC User is £19.90 (for overseas, please phone).

THE BEST PROGRAM AND TEXT EDITOR FOR THE ARC HAS JUST GOT A LOT BETTER

NEW

DeskEdit2

A major new release of the popular and powerful editor DeskEdit brings a whole toolkit of features that will assist all programmers, whether novice or experienced, and whether using Basic or C - and all within Acorn's powerful multi-tasking RISC OS Desktop. There is a lot for text users too.



New features include:

- **Basic program Renumber** - including partial renumber and marked sections.
- **Basic Program Indenter** - indents Basic programs after IF THEN, REPEAT, FOR etc.
- **Basic Abbreviations** - all Basic V's several hundred abbreviations are implemented).
- **Programmer's Calculator** - a powerful calculator especially designed for handling bits and bytes.
- **Multi-purpose Browsers** - an easy to use browser window containing a list of finds. Clicking on any one of these will take you to the corresponding place in your file.
- **Throwback** is fully implemented so DeskEdit can respond to messages from C compilers etc.
- **!FIND** - DeskEdit comes with a powerful stand-alone Acorn application called *Find*, which can find text strings in a whole group of files, just given a wildcarded filename.
- **Extended Saves** - DeskEdit 2 can save a special data file with the position of the caret, wordwrap correctly set and markers

All this of course is in addition to the features that have made DeskEdit so popular among users of Acorn machines, and which resulted in glowing reviews when it was first launched a year ago. IN FACT DESKEDIT IS SO GOOD THAT IT IS USED WITHIN ACORN ITSELF!

DeskEdit 2 (disc, new manual, keystrl and quick reference card) PDE2b £31.95 inc + £2 p&p
DeskEdit 2 Upgrade Code PDEXa £9.95 inc + £2

NEW

Wimp Programming for All
on Acorn RISC Computers

by Lee Calcraft and Alan Wrigley

This new book provides programmers with a complete introduction to all the techniques involved in writing multi-tasking Wimp programs to run within the RISC OS Desktop environment. No prior knowledge of the Wimp is assumed and the tutorial style of the book will enable all programmers to understand the concepts involved and to develop their skills in writing high quality programs within the Desktop environment.

The book consists of ten main chapters and a number of appendices:

- Chapter 1: Introducing the Wimp
- Chapter 2: Windows
- Chapter 3: The Wimp Poll Loop
- Chapter 4: Error Handling
- Chapter 5: Icons
- Chapter 6: Menus
- Chapter 7: Redrawing Windows
- Chapter 8: The Wimp Message System, Loading and Saving Data
- Chapter 9: Templates
- Chapter 10: Printer Drivers and Outline Fonts

- Appendix A: Indirection Operators
- Appendix B: Application Resources
- Appendix C: Setting up a sprite area
- Appendix D: SWI calls described in this book
- Appendix E: Associated Disc
- Appendix F: The Wimp Programmer's Toolkit
- Appendix G: DeskEdit

We believe that Wimp Programming for All will prove to be the definitive book on this subject for all users of Acorn RISC computers.

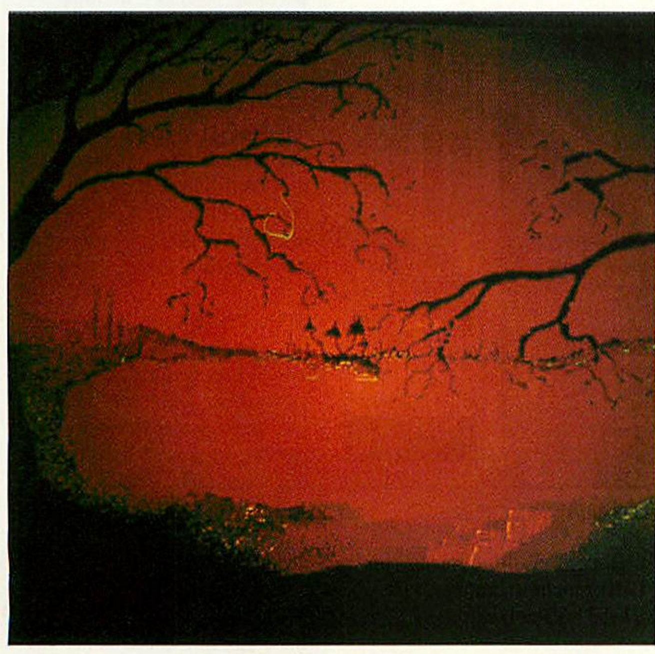
To support the book there will is a **disc** containing all the programs as listed within the book, together with additional supporting applications.

Wimp Programming for All book	**Code BK12**	**£12.95 inc + £2 p&p**
Wimp Programming for All disc	**Code BK13**	**£4.95 inc + £1 p&p**

RISC Developments Ltd. 117 Hatfield Road, St Albans, Herts AL1 4JS. Tel. 0727 40303 Fax 0727 860263



READER'S PICTURE



AFTER the spate of ray-traced and rendered pictures sent in over the past few months, it's good to see a few more 'traditional' pictures arriving in the post. This month's winner is a rather mystical woodland scene called Pool, painted by Leila Crerar, an art student from Powys, Wales. We don't see many pictures from female readers and we'd like to see more because we know you're out there. Send your pictures, be they big or small, to the usual address. Any art/design package can be used, or even your own software. Don't forget to include information about any interesting techniques which were used.

ART DOWN UNDER

IT'S always encouraging to hear about the Archimedes being used outside of Britain. Scotch College in Adelaide, South Australia, runs an annual competition called 'House Creativity', designed to introduce computers to the non-technical.

Using an A3000 and *Pro-Artisan*, teams are given three pre-drawn lines on screen, and asked to develop a picture in just five minutes.

The competition is held in the school's lecture theatre and the computer's output relayed to a large 3 x 2m video-projection screen for everyone to watch.

A video is available, showing the pupils at work. Teachers at Scotch College hope that it will prompt others to start similar events and promote the use of computers in the classroom. Contact Marc Newton at Scotch College, Carruth Road, Mitcham, Adelaide, South Australia 5062 for a copy of the video.

REVELATION IMAGEPRO

REVELATION has undergone a number of changes to become *Revelation ImagePro*. The new program offers a number of enhancements.

Revelation 2 came as two programs; *Revelation 2* and *Revelation Xtra*. Both programs have been combined into the one application. For example, *Draw* files can now be dragged into *Revelation ImagePro*, and automatically converted into a recognisable sprite format.

Special effects were always a strong point of the original, *Revelation ImagePro* has been further enhanced to include blends (overlaying motifs onto existing pictures) and mosaics ('pixelating' areas of the screen by a definable amount).

Changes to existing tools now mean that the 'Mark' menu in *Revelation 2* has been incorporated into the 'Tool' menu so changing brush or pen size is much simpler.

Although *Revelation ImagePro* is an improvement over its predecessors there are a number of omissions that I wasn't really expecting.

Hot Keys (bypassing menus with pre-defined key presses) are a major part of Risc OS and most of the leading titles such as *Impression* use them. Selecting a tool just by pressing a function key allows for greater speed and ease of use.

A grid facility for easy alignment of lines and shapes is another major omission. A zoom facility with no grid overlay is rather like a chess board without any squares.

Both 'omissions' were put to Longman Logotron, and the official comment was 'People would have too much to learn if hot keys were included'. Why not include them but have the option of turning them on or off? Perhaps readers who use *Revelation* and *Revelation 2* at present would like to put forward their ideas on the subject.

When quizzed about future versions and updates on *Revelation ImagePro*, Longman Logotron said they would be waiting until Acorn standardised on new formats ie. 24-bit colour graphics. There are rumours of finished VIDC2s but it seems that there will be no new machines for some time, so a new version of *Revelation ImagePro* isn't likely for at least a year.

Although it is missing some very useful and obvious features, I still think that *Revelation ImagePro* is the best art package that I have used on the Archimedes.

Interested artists can contact Longman Logotron on (0223) 425558, or see the company on stand 11 at the *BBC Acorn User* show.

NEWS IN BRIEF

● Yet another ray tracer has been launched for the Archimedes. Called DBW_Render, the program has been converted from an Amiga public domain ray tracer of the same name. Features include different types of surface, 'fractal' objects, wave sources and photographic depth of field. It comes complete with examples, source code and a selection of utilities. To get a copy send £2 and a blank disc to Neil Coffey, 38 Bank Top, Southowram, Halifax HX3 9PD. Envelopes should be marked 'DBWR'.

● One appplication you might not have thought of for your Archimedes is the use of IBM PC graphics packages for image processing. Both Acorn's *PC Emulator* and the Aleph One 386PC allow such software to be used with ease. A variety of useful PD graphics packages exist for the PC, as well as the more well known professional packages such as *Correl Draw* and *Adobe Illustrator*.

Aleph One's soon-to-be-anounced Windows Driver for the 386PC allows these programs to run as fast as on 486 PCs. For further information contact Aleph One Ltd, The Old Courthouse, Bottisham, Cambridge CB5 9BA. Tel. (0223) 811679.

● A few months ago, I covered how to implement new window sprites for your desktop using RISC OS 3.00. This is still possible in the recently launched RISC OS 3.10, and here is the command.

The easiest method of changing the window sprites is to get a file of alternative sprites and call it something like !Tools. This file should then be placed inside the !System folder on your hard disc or boot disc.

The !Run file in the !System folder must be changed to include the line '*ToolSprites <Obey$Dir>.!Tools', where <Obey$Dir> is the pathname for the file '!Tools'.

Something 'graphical' will be on offer for the best set of sprites sent in. Please send your entries to: Graphics page, BBC Acorn User, 101 Bayham Street, London NW1 0AG.



TIME TRAVEL WITH EQUINOX

NOSTALGIC communications enthusiasts who yearn for the good old days when they used to log on to Prestel every night and key hash well into the early hours, can experience wonderful *deja vu* by calling Equinox BBS.

Run by Paul Vigay, one of the 'names' of the viewdata BBS world, Equinox retains the look and feel we all once loved but in the alternative guise of Micronot [sic]. *Wayne's World* it is – NOT!

Equinox caters for all BBC and Archimedes users with news, reviews, information and telesoftware. There are special interest areas covering subjects from *Ample*, biorhythms and corn circles to revision notes, videos and the Young Conservatives. There is even a special CUG (closed user group) for ex-Micronet members. Equinox runs on a BBC machine and is on (0705) 871531 ViewData.



Equinox brings back the good old days of comms

FACING UP TO THE FAX

MORE and more new modems are appearing with dual data and fax capability, and this gives owners of 32-bit Acorn machines with comms interests an opportunity to add fax facilities to their systems without having to install extra expansion cards.

ArcFAX is a software package from David Pilling that allows any Archimedes with a fax/data modem to double as a fax machine. *ArcFAX* runs in the desktop and allows background transmission and reception of faxes, including delayed sending and automatic retries. A built-in telephone directory allows group sending to a number of people (great for mail shots) and call logging is also available.

Documents can be faxed directly from applications such as *Ovation* or *Impression* by installing *ArcFAX* and an *ArcFAX* printer driver. The document is converted by the driver into a TIFF format file and *ArcFAX* sends it to the chosen destination.

Documents sent by *ArcFAX* have a much higher resolution than those from conventional scanner machines and five point text on a recieved fax is very readable.

Received faxes are converted to TIFF files and marked as new. You can open a window on the document and move through the pages, saving them whole or in parts as sprites for permanent storage or printing.

Image processing allows the sprites to be scaled down, different modes to be used and anti-aliasing. *ArcFAX* features a powerful script language which is also used for the modem drivers, so changes to the drivers for different Class II fax/data modems can easily be made.

Many of the external fax/data modems available are not currently BABT-approved – for instance the SupraFAX V32bis and the Twincom 14.4 DF are both class II compatible, but at the time of writing, not BABT-approved. You might buy one of these but, of course, I couldn't possibly recommend that you actually use it! You wouldn't do such a thing, would you?

ArcFAX costs £23.96 and is available from David Pilling, PO Box 22, Thornton Cleveleys, Blackpool FY5 1LR.

● David also has a new version of *Spark* available now, called *SparkFS*.

FIXING FIDO

WHETHER a FidoNet BBS is a Point or a full Node, the Sysop will want to be able to offer Echomail facilities to the users. The Sysop may either dial up the Boss or Hub system to exchange message packets ('polling'), or the Sysop may subscribe to a Midnight Line operated by the Hub system, which then calls up each node in turn to exchange messages in the early hours.

Most Hubs operate an automatic message area registration system, such as 'AreaFix'. This program runs on the Hub system and can examine the contents of a Netmail message sent to it by a Node, containing the names of the Echomail areas desired, and fix the areas requested into the distribution list for that Node. The Hub system will also be able to supply a list of all the Echomail subject areas available, and details of how to join and resign from them.

Where AreaFix is in use by the Hub, the Sysop can send a Netmail message to the Hub addressed to user AreaFix to join and leave areas as required. A password will be required by the Hub to enable mail exchanges, and this has to be configured at both ends.

NEWS IN BRIEF

● Connections BBS; Another closure, or a new beginning? Steve Pursey has decided to close his eight-bit bulletin board, and has sold his BBC Master and the drives on which it ran for four years. The reason is that he is now an Archimedes owner, and hopes to run a BBS again on one in the future. We look forward to his re-appearance.

● Risc Developments is now shipping *Hearsay 2* as version 2.14. A new feature is incorporated in this version that allows you to preview GIF graphics format picture files on screen as you download them. *Hearsay 2* costs £75 plus VAT.

● Rich In Paradise; by the time you read this, Richard Paddle's BBS should be back online after the break announced earlier this year. The number is (0803) 666808 and it is FidoNet node 2:252/307.

● Want to start a BBS without hardware costs? Sysop A J Brown of the Electronic Courier BBS in Belfast is offering space to add an Archimedes section to his mainly Macintosh-oriented system.

Operating with a full graphical interface, it can provide download, email and message threads for Archimedes users.

Anyone interested or who wishes to view the BBS for themselves should dial (0232) 401 737, and log on as 'Guest' with the password 'Guest'.

● Nightingale is another bulletin board that is back after a break in service. Paul James' Bristol area BBS is now online at night on (0272) 668060 from 11pm to 8am. If you call outside these times you will probably get a voice line or answerphone message.

● YOU can contact our comms columnist, David Dade, with any news or information by writing to him c/o: *BBC Acorn User*, Redwood Publishing, 101 Bayham Street, London NW1 0AG. Or contact him by modem on Arcade BBS, User #2 081 654 2212 or 081 655 4412.



The most advanced communications package for Archimedes systems.





Hearsay II is a multi-tasking and fully RISC OS compliant communications package designed for easy communications for the first-time user, but with a wide range of advanced features making it the professionals choice.

It is ideal for use with Prestel, Telecom Gold, Campus 2000 and Compuserve, and also provides very high quality VT320, VT102, VT52 and Tektronix 4105 Colour terminal emulations for direct connection to mini and mainframe hosts.



In addition it gives access to Minitel systems such as the Teletel service and provides Xmodem, Ymodem, Zmodem and Kermit file transfer, a comprehensive script language and an auto-dial number directory.

- Fully RISC OS compliant
- Multi-tasking and background transfers
- Scalable terminal windows
- Xmodem, Xmodem1K, Ymodem, Zmodem, Kermit, SEAlink, and ASCII file transfer
- Batch file transfer
- Script language based on a subset of C
- Macro processor and definable keyboard
- Support for RISC OS printer drivers
- Number directory with auto-logon and password protection
- MNP 2 and Vasscom error correction
- Supports most popular modems e.g. Hayes

Upgrade to version II

Upgrade from Hearsay I for only £35 plus VAT plus £3.10 carriage. Please return original disc to address below.

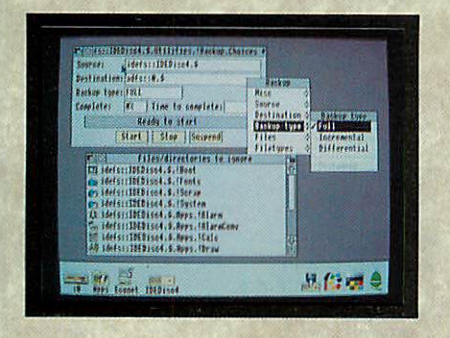
'It does everything we want, and is a pleasure to use.' ARCHIVE Jan 92

'Background data transfer, a well documented script language and high RISCOSity make this a powerful contender...' ARCHIMEDES WORLD April 92

'...the manual is an excellent example of thoroughness and clarity...Hearsay II is a very good communications package and is thoroughly recommended...' ACORN USER May 92

Hard Disc Companion II

Hard disc backup and retrieval



Version II of Hard Disc Companion offers superior performance and efficiency. It has been completely re-written and is now twice as fast and even easier to use.

It provides a structured approach to the backing up of hard drives, and the recovery of files in the event of disc failure or accidental file deletion. Both Full and Incremental backups are supported, and the files to be backed up or ignored may be specified using simple drag operations.



The entire backup specification may be saved in a script file for use at a later date. Hard Disc Companion II uses an efficient compression system to backup as much data as possible onto the floppies without increasing the backup time.

Separate applications are included to restore entire backups or just selected files.

Upgrade to version II

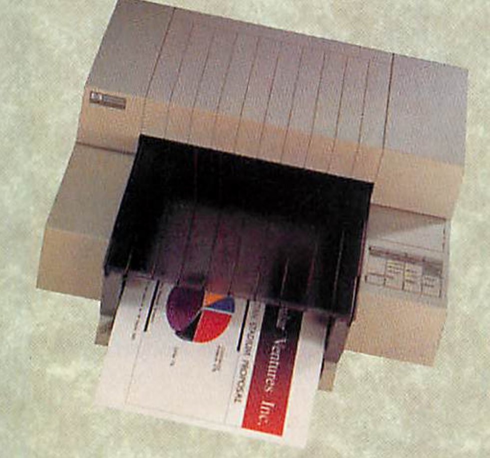
Upgrade from Hard Disc Companion I for only £15 plus VAT plus £2 carriage. Please return original disc to address below.

'Good value for money...A nearly foolproof interface...Hard Disc Companion keeps things simple and as fast as possible...' MICRO USER May 92

'...it is certainly the best hard disc backup utility that I have ever used.' ARCHIVE Apr 92

Colour Printer Drivers

For HP DeskJet 500C and Star colour printers



The **PrinterDJ** printer driver produces near laser quality output from the highly acclaimed Hewlett Packard DeskJet 500C colour printer.

Both release 2 and release 3 drivers are supplied, each supporting 75 x 75, 150 x 150 and 300 x 300 print resolutions in monochrome, grey scale and full colour modes.

Only £15 each

PrinterLC is the approved printer driver for Star colour dot-matrix printers. It is suitable for both 9 and 24-pin printers including: LC24-200, LC-200, XB24-10 and LC-10. PrinterLC is a release 2 driver, supporting print resolutions from 60 x 72 dpi to 360 x 360 dpi depending on the printer model. Also suitable for many Epson and NEC colour printers.



RISC Developments Limited. 117 Hatfield Road, St. Albans, Herts. Al1 4JS. To order, or for more information, call (0727) 40303

All software is suitable for Archimedes, A5000 and A3000 systems with 1Mb RAM and RISC OS 2.00 or 3.00.

Please add VAT to all prices and carriage of £3.10 for Hearsay II and £2 for other products.

All prices are for single users—site licence prices available on request.

NATURAL RESOURCES

Pete Worrall explains how resource discs can enhance your graphic design and desktop publishing

Imagine all your graphics requirements stored on one disc, and consider the difference this would make to your creative output. Access to the visual resources can be the key to successful graphic design or desktop publishing. Unfortunately, copyright-free resource discs are few and far between, which is a pity as they could provide the fuel for the excellent software currently available for Acorn computers.

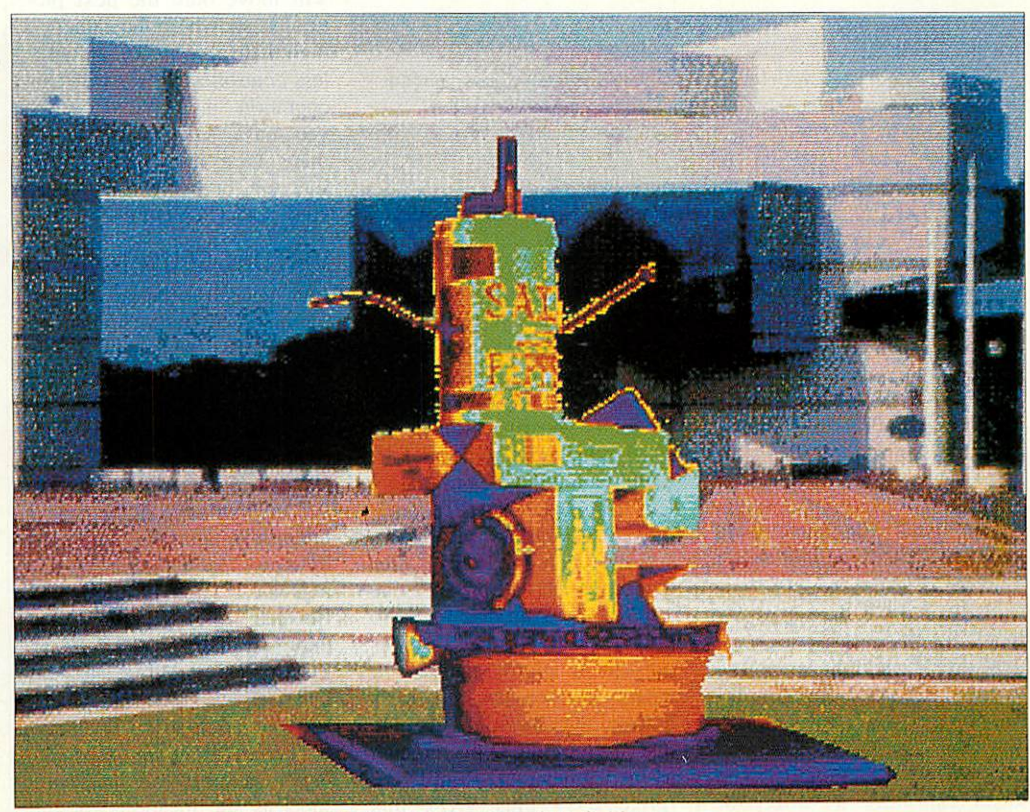
By definition, resource discs should contain a comprehensive range of useful visual images, for use at home or work. It is now possible to address this situation by producing quality discs for your own use. Let's start with the contents. Subject matter will vary and the following were developed in response to education market demands: natural and mechanical forms; environments; graphics and signs; history of design and human expression. Each of these categories has different uses and can be subdivided – for example, 'environments' breaks down into industrial, urban, rural or tropical.

Before you start your collection, it is a good idea to compile a list of priorities. At the top of my list were leaf/flower images for textile design and local industrial images. My pictures were snapped with a pocket-sized Canon Still Video Camera – basically a point and shoot routine, except that the pictures are recorded onto a two inch re-usable mini-disc instead of film. This camera will output the pictures either through an ordinary TV set or through a digitiser onto the computer screen. In this case I used a 2Mb A3000 computer and Pineapple Colour Digitiser. The Miniature Image Check Control Icon disc, characterised by a MICCI mouse symbol, is one of two discs supporting this digitiser and has an excellent easy to use image processing control panel (see Video Diary, *BAU* October 1992).

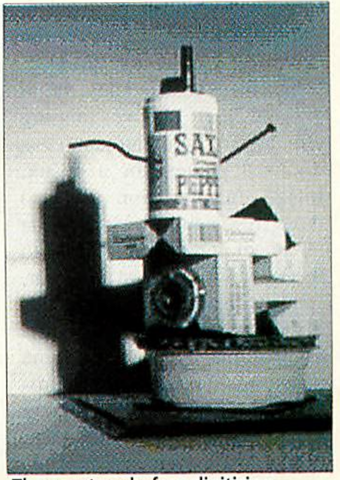
Two important points are worth remembering regarding the image processing. First, careful manual tuning with the Gain, Lift and Saturation tuners on the digitiser box will determine the quality of the resource image. Second, the Image Size Preselect toggle will set the image size as a fraction of the whole screen, which means that when it's set on a half, four images the same size can be placed on one screen for comparative analysis. This function enables you to easily and economically construct your own demo disc containing 16 images (32 if compressed) instead of four 160K mode 15 screens.

For example, Twenties style Art Deco might be presented on 'one screen' showing cinema architecture, ceramics, furniture and poster design to an audience. I have produced discs using this method to good effect in the classroom comparing different textures, colours, patterns, structures; the list is endless.

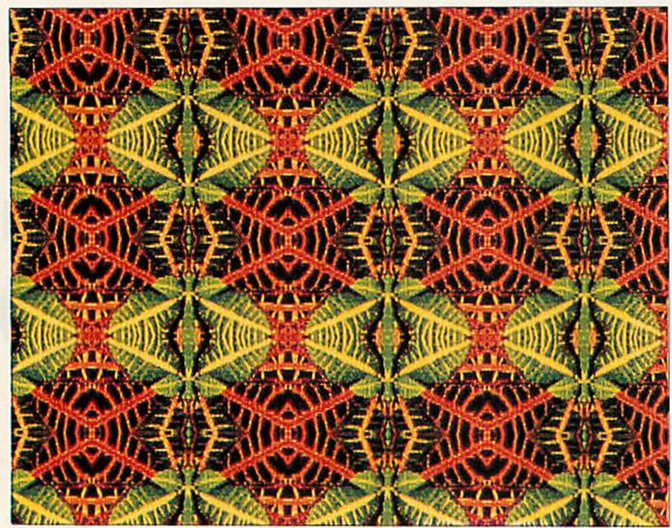
Clip art – by line art, symbols, logos, engravings and woodcuts – can be easily copied using a hand-scanner. The Archi Hand Scanner allows copy at up to 400 dots per inch with a width of four inches. Some publications, such as Dover Pictorial Archive Series, specialise in line art on a range of topics, and allow free use of up to ten



A junk sculpture image created using Watford Electronics' colour digitiser



The scupture before digitising


Leaf textile pattern created using Longman Logotron's Revelation 2

HINTS AND TIPS

- Avoid indoor shots with lots of detail unless you have good lighting.
- Strong outdoor colour contrasts and simple compositions often provide the best results. (Remember your digitised images have a maximum of 256 colours).
- The Macro function is excellent for close-up work.
- The camera can double up as a colour scanner using the tripod adaptor and set on Macro. (Extra lighting is essential for this).
- Carry the camera wherever you go.
- The RC 260 costs £499 and, despite the price, represents a good investment, mainly due to portability and image quality. A recent addition to the range is the RC 560, which costs £1,750 with built-in lens control and enhanced image quality.

illustrations. Pre-1920s books can also provide scannable copyright-free material – if in doubt, consult the Copyright Act of 1988. Watford's Archi scanner is very accurate, and it is worth drawing simple signs and symbols with a pen for scanning and making an original disc. Colour Scanners are more expensive, but are useful for copying your photographs.

Gathering images can be time consuming initially. The discs can have a variety of uses. As an educational resource they can be used to introduce a topic, with the computer screen as an electronic blackboard. They might provide that elusive missing clip art for a document or a digitised picture for a poster. Image manipulation is also more rewarding with a wide range of quality pictures to work with, not just the car, space-techno, pretty girl fodder often used and distributed as exemplary material. Some of the images may simply provide the stimulus for text experiments and encourage different software uses.

With National Curriculum demands bearing down on local education authorities, it could be a good idea to press a CD-Rom disc. Next Technology Corporation provide a service called 'Pressed for Time', which will produce one 100Mb CD-Rom disc for £180 plus VAT (further copies pressed at approximately £70 each). All you have to do is collect the material. As the discs require a CD player such as the Cumana CD-Rom Drive (price £379 plus VAT), this could be sited as a central resource in a library serving a wide range of needs across the community.

HARDWARE

I use the RC-260 Canon Ion Still Video Camera. The RC-260 is 11sq cm square and has playback functions similar to a VCR or video camera. It records onto small floppy discs with a 50-picture capacity that cost £5 each. Recording features include: auto exposure; built-in flash; single, continuous, three pictures per second and interval recording; and a macro switch (30cm distance).

A useful accessory is the conversion two lens set, consisting of the Teleconverter, which extends the focal length by a factor 1.3, and the Wideconverter, which reduces it by a factor of 0.7 – although this is expensive at £90.

Playback through a computer system (with digitiser) is easy. All you have to do is screw the AC coupler to the battery charger to run the camera from mains. Then link a BNC to phono lead from the digitiser to the video out socket on the AC coupler. To view the pictures the main switch must be set on Play. Pressing the Forward button will move onto the next picture, as shown on the camera's digital display panel. A wireless controller allows armchair operation if required. After you have saved your work, there is a useful Erase All function, or you can manually erase selected pictures.

VIRTUAL SCULPTURE

Ever wanted to be an artist of international stature? This can be accomplished with a few environment pictures and a bit of sculpture.

A junk sculpture 30cm high on an 8cm square base, consisting of cigarette packets, salt, margarine containers and nails, was designed and built by Kerry, aged 14, from Willingsworth High School. The finished mini-sculpture was digitised using the Watford Electronics' Archi Real-Time Digitiser with a video camera and saved onto disc.

The next stage involved taking a number of landscape shots as site locations for the sculpture. Clares' *ProArtisan* was employed for the final 'clever bit'. Loading the sculpture onto screen, use Zoom and Draw to carefully block out the background in one colour. Then select this colour on the Pop-up Transparency Window on the Sprite menu. Cut this out and save it, then load the background (saved as a screen) – in this case, it is Birmingham's International Convention Centre. *ProArtisan*'s easy-to-use Scale Current Sprite function will enable you to position the sculpture and make it any size.

This type of image-manipulation enabled pupils to see their work outside the classroom in a public and prestigious situation. They found it exciting and it stimulated ideas about using computer art as murals on public buildings. Great fun was had by all in moving famous works of art to different locations and it inspired several sculpture resource discs. This is just another way that new technology can be used to raise issues and awareness through the use of resource images.

A NEW LEAF

The leaf textile pattern in the pictures was produced using the Pattern Option on Longman Logotron's *Revelation 2*. Using mode 15 on Palette, load *R2* onto the icon bar, then using the resource disc, double click on the required sprite. In this case my demo screen showing nine images was loaded; spot the one I used for the design. Cut out a small rectangular area using the Scissor tool. The Motif option will show the single cut-out which can be saved. Selecting Pattern reveals a versatile textile designer panel, and the leaf cut-out can be tiled, mirror-imaged and spaced in endless variations.

Spend some time experimenting before you select OK on the bottom right of the Pattern Dialogue box. To view your design, create a new page using the R2 icon and select Fill Roller on the default configuration of Motif Tiled in the new page. It is also worth spraying, drawing or painting the leaf on to the screen for different effects. For fine tuning, the excellent Colour Shift option (accessed on the Page menu) provides colour change facilities and looks rather like a mixing desk.

Experimentation is the key and the contrast, saturation, tint and tone of the image can all be altered easily. Before you use this, save the original and then you can develop your theme in a multitude of different ways. In my final result I particularly liked the interplay between the vertical and horizontal elements in the design and the colour contrasts. In the end, print out the best results, which may form computer generated inspiration for textile processes.

ROM FOR IMPROVEMENT

Ian Burley asks whether the new Risc OS upgrade has been worth the wait

Supplies of the latest version of Acorn's Risc OS operating system, release 3.10, should be available this month. The vast majority of Acorn Risc computer users currently have Risc OS 2.00 chips installed, although for a year now A5000 users have been using Risc OS 3.00.

Acorn obviously wants everyone to upgrade to Risc OS 3.10. The upgrade costs £49 including new Roms, support discs and manuals. A5000 users who already have the manuals can obtain the Roms only for £19. Acorn says it will be increasing the upgrade cost next year, but £49 isn't exactly pocket money, so just what are the benefits?

OVERVIEW

Risc OS 3.10 features a long list of improvements over release 2.00. Key applications are now instantly accessible from Rom instead of disc. Three Risc OS fonts are now also accessible from Rom.

The Risc OS desktop has a host of new options, some of which can give a fresh look to the screen. Printing can now be done in the background and is controlled by a more sophisticated centralised print manager which supports a wider range of printers. MS-Dos and Atari ST format discs can be recognised and if your computer has the necessary hardware, a new 1.6Mb Acorn disc format is available as well as the ubiquitous MS-Dos 1.44Mb.

Disc operations, including format commands, will multitask with other applications. Arm3 processor support is built in and there is an increased range of monitor types supported.

The new Risc OS Roms have a much larger capacity than before. Risc OS 2.00 is contained in 512K of Rom while Risc OS 3 needs 2Mb. The extra space is partly taken up by improved versions of *Paint*, *Draw*, *Edit*, *Configure*, *Alarm*, *Calc*, *Chars* and *Help*. All these can be instantly accessed from the icon bar – a big plus point for users who don't have a hard disc.

Draw has much better text handling and fast graduated fill functions, interpolation (inbetweening) plus compatibility with Acorn's new 256 grey scale graphics format, although *Paint* curiously has omitted this feature.

Risc Os 3.10 also offers a fast graphic rotation routine which is available to any application. *Alarm* has been tightly integrated and can do clever things like launch other applications at a pre-set time. *Edit* now works better with Risc OS outline fonts and has improved text formatting options. Basic programs can be dropped straight into *Edit*, with text conversion being automatic.

Corpus, Trinity and Homerton, are now instantly available to all applications from Rom and the all-important *Configure* application is much more comprehensive and easy to use.

CONCLUSION

Risc OS 3 is a big improvement over 2.00 and well worth upgrading to. If you are not confident about delving into your computer, ask your local dealer to fit the upgrade.

Otherwise, you need to access the Rom sockets, remove the old ones, change some links on the board and install the new Roms. Older A300 and A400 (not /1) users will need a hardware upgrade to take the new Roms.



Help, a guide to Risc OS 3.10 from Sherston Software

FROM 3.00 TO 3.10

Is the cost of upgrading from 3.00 to 3.10 worth it? The answer is yes. Gone are the many bugs including the ADFS buffers problem. Acorn says that printing is faster and there's now Apple LaserWriter II support. Added Econet cacheing will give extra network speed, background operation of the filer has been improved and boot-up time is shorter. Bidirectional parallel port functionality is now supported (A5000 and later) and there is a large screen mode for the visually impaired (mode 22). ChangeFSI image conversion from other platforms is standard. The desktop features Acorn's colour translation technology and there's also a new Welsh character set. Acorn's documentation for Risc Os 3.10 is comprehensive, beautifully produced and easy to use.

- You can tell which version of Risc OS your computer has fitted by pressing f12 to get to the command line and typing FX0 followed by RETURN. Afterwards, press RETURN once more to return to the desktop.
- Sherston Software has produced help for Risc OS users in the form of *Help 3* – a 100-page book by David Eccles accompanied by a tutorial disc. The book is easy to follow, and great for people not familiar with Risc OS. However, for someone who already feels at home with Risc OS 2.00, Acorn's manuals should be more than adequate.

PRODUCT DETAILS

Product: Risc OS 3.1 Upgrade
Suppliers: Acorn dealers
Price: 2.00 to 3.00 £49.
3.00 to 3.10 £19
Product: *Help 3*
Supplier: Sherston Software.
Tel: (0666) 840433


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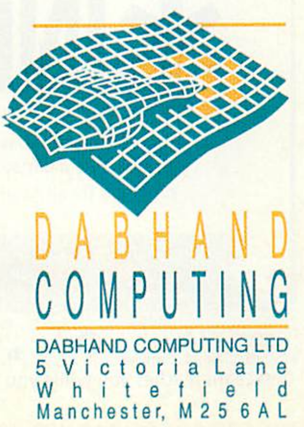


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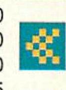
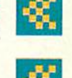


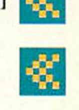
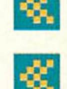
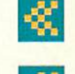
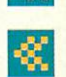
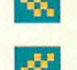
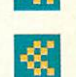
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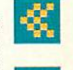
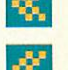




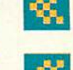






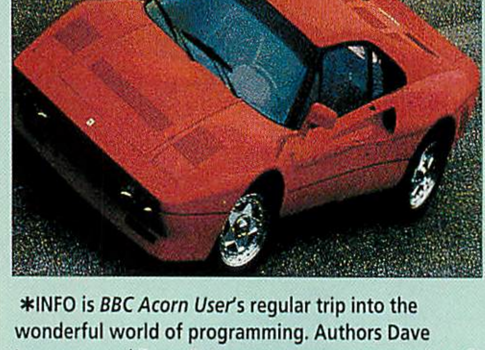
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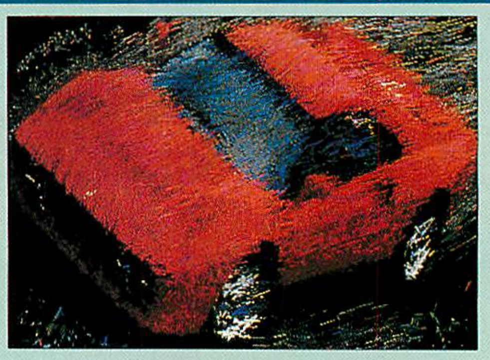
Every month, BBC Acorn User offers you the best value package in the Acorn

BBC *Acorn User* offers you the most varied selection of programs and applications of any Acorn magazine. From simple one-liners, to full-blown applications, all are included on the monthly disc which is free with every *BBC Acorn User* subscription. If you are not a subscriber, then you may like to know that a UK subscription is only £22.95, including the free program-packed 3.5in disc each month. To subscribe, all you have to do is complete the form at the bottom of the opposite page and return it to us by October 23 and we will send you the subscriber's featured here disc for this issue absolutely free.

Eight-bit users have their own 5.25in subscribers' disc too. This month, there is an eight-bit version of *Desklearn*, along with a selection of ✱INFO programs, such as a seasonal fireworks display, and a scrawly writing generator.

✱INFO





✱INFO is *BBC Acorn User*'s regular trip into the wonderful world of programming. Authors Dave Lawrence and Dave Acton present programs and small articles written by themselves and other readers, and you can always find a bumper crop of interesting programs on the subscribers' disc.

On the disc this month we have *Abstract*. This is probably one of the best programs published in ✱INFO. It is simple but effective, and will turn any image into a masterpiece within a few simple strokes.

Gong is an example of the sort of program that ✱INFO is famous for. It is moving art generated by your computer, and you can easily alter the program to change how *Gong* looks.

✱INFO is also famous for its tutorial features. This month you'll find on the disc four programs that show how to use colour on your 32-bit Acorn machine. It is not simple but you can unplug the routines, and put them back into your own programs. If you do, though, remember to send them in so that we can see your handy work.

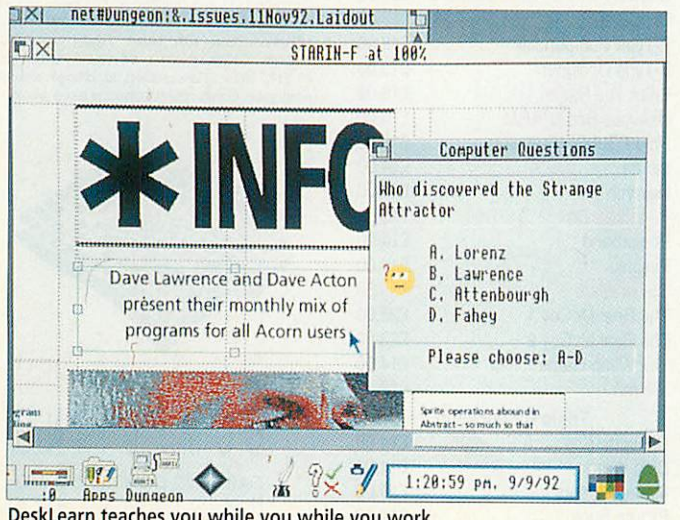
Pointer is an example of a useful desktop application that you'll find on each subscribers' disc. This little application will allow you pointer to wrap around the desktop screen, just one of the many applications that will improve the desktop environment for you that you'll receive over the next 12 months if you subscribe now.

✱INFO fans may also like to know that this month we have a special limited offer in the form of a specially compiled, two-disc set. The discs contain some of the best ✱INFO programs over the past year, and extra features, like an index to all of the articles. See page 58 for full details.

DESKLEARN

Every month in *BBC Acorn User* you'll find useful applications that we think deserve a whole article of their own. One such application this month is *Desklearn*.

Desklearn is designed to tax your brain, as well as teach you things. Every so often it will pop a question onto the desktop in a small window – answer it correctly and your achievement will be recorded, but answer incorrectly and it will ask that question more often until you get it right.



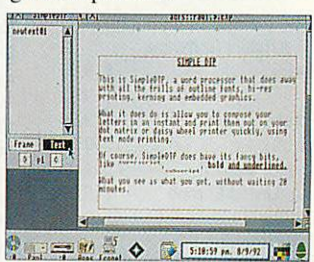
DeskLearn teaches you while you while you work

The advantage of *Desklearn* is that you can carry on working while it teaches you, and you control how often the questions pop up. This means that *Desklearn* can be adjusted for fast or slow learning. It is perfect for learning languages, and many different types of question files can be created using *Edit*.

And remember, you will only find *Desklearn* in *BBC Acorn User*.

SIMPLE DTP

Although the Risc OS environment caters for dot-matrix printers, it is definitely geared towards laser or inkjet printers. *SimpleDTP* is another application written specially for our readers. With it, you can print text using the fast draft mode of your dot-matrix printer, rather than the slow graphics mode offered by many Risc OS packages. It is also perfectly suited to daisy-wheel or golfball printers.

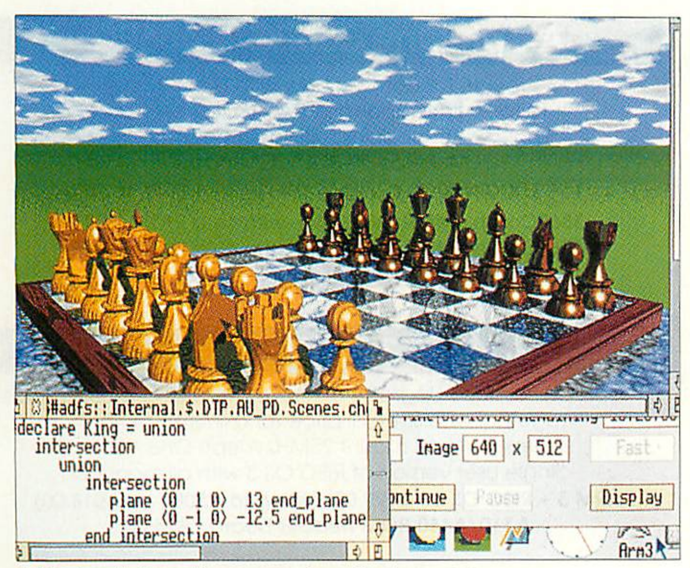


SimpleDTP, fast and easy printing

Although you can already print in draft mode using *Edit*, *SimpleDTP* offers a DTP style approach to page layout. Text can be placed in frames and moved around the page. Styles, such as underline or

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Public domain is another source of excellent programs...

bold can be used, and you can justify your text.

SimpleDTP isn't designed to offer everything. It is structured so that you can run out quick letters and simple documents, with the least fuss.

Again *SimpleDTP* is exclusive to *BAU* and due to its length appears only on this month's subscriber's disc.

PUBLIC DOMAIN

Sources (other than *BAU*) of good, nearly-free software are public domain libraries or bulletin boards. With luck you can find some really useful PD software, but with *BBC Acorn User* this month you'll find a small selection of some of the best PD applications on our subscribers disc.

Tim is the speaking clock for those of you who are not that precise. A click on the icon bar and it will announce, for instance, that 'it's nearly a quarter to five'. *Coster* is an application for comms enthusiasts, for keeping track of how much money you are spending while you're on-line. If your desktop is plain and boring, then the addition of *Locomo* will spruce things up – a whole cowboy western film, with pseudo sound effects on your icon bar!

Memphis is an application for those of you struggling with the Ram filing system. Use this application instead and you can keep on adding or deleting files, and *Memphis* will automatically re-size itself so that you never need to have unusable memory sitting inside your machine again.

Finally, *Out to lunch* is a great screen blanking routine, with configurable displays. You can use it to prolong the life of your monitor.

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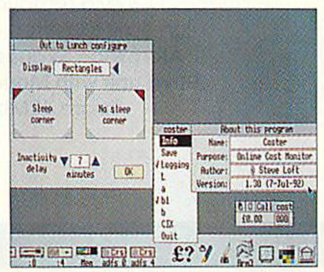
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EDUCATIONAL ADVICE

A special section for teachers and concerned parents who are looking for helpful advice on all aspects of using Acorn computers in the classroom



NEW ACORN MACHINES

Visitors to the show will be able to view Acorn's new portable computer, the A4. And with rumours of additional new products from Acorn, the show could be your first chance to see them



MULTIMEDIA APPLICATIONS

With the development of CD-ROM and Acorn Replay, there will be opportunities to view the latest multimedia applications for educational and other uses

IT'S AN EDUCATION AND A WHOLE LOT OF FUN

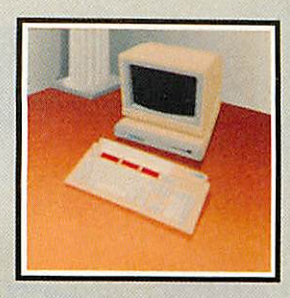
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NEW SOFTWARE

Education, games, home accounts, business, DTP, graphics....whatever your interests, there is a host of new software packages on show to see and try



GAMES GALORE

As well as Quest for Gold, there will be a host of new and exciting games for you to try at the show. Don't miss your chance to play the latest 'shoot 'em ups' and adventures

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WIN A CHRISTMAS GAMES HAMPER
Most Christmas hampers are full of food, ours is brimming with games, over £1000 worth! It can be won by one lucky reader – could it be you?

HOW TO START WRITING GAMES
We show you how to begin writing your own games, and present a few utilities to get you going.

NEW ACORN MACHINE GUIDE
How to make the most of your new Risc OS 3 Acorn computer in our easy-to-follow guide.

ACORN POCKET BOOK
We take a detailed look at the new Acorn pocket book. What are the benefits of this little machine, and how can it be put to best use in the classroom?

CABLE NEWS REVIEW
We review Lingenuity's multimedia and presentation package that will help you get your words across in the prettiest of ways.

DRAW BENDING
In a programming feature we present four fun and practical utilities to produce some very special effects using your *Draw* files.

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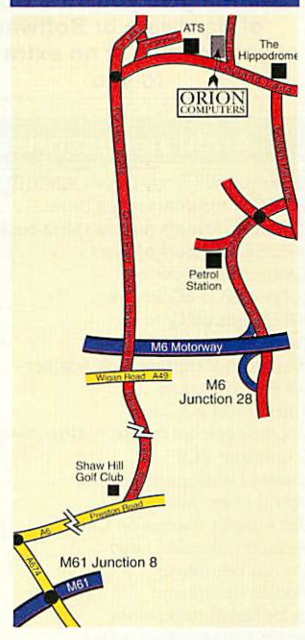
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TDK DS/DD 3½"	4.80	25	45	115	225	510
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Orion Computers

Watford Electronics

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A5000-4Mb HD120	–	–	£1599
A5000-2Mb ES	–	£1299	–
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Acorn Inkjet Printer add £199

For more Printers, see pages 5 & 6

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A4 Notebook with 2Mb RAM	£1399
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FREE OFFER

When you purchase an Archimedes Micro from Watford, we will give you 10% worth of Hardware or Software of your choice at no extra cost to you.

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A5000 – 100Mb 18mS Hard Disc Upgrade	£269
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Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided.
P.S. A310 upgrades require a backplane and a fan.

- **3HDP** – Hard Disc Podule only £99
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- **4HD40** – 40Meg Hard Disc for 410 £195
- **4HD50** – 53Meg Hard Disc for 410 £260
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Acorn A3010 Family Pack

Supplied with 3.5" Floppy Disc Drive and a mouse, upgraded to 2Mb RAM, Colour Monitor and lead, TV modulator, 30Mb fast IDE Hard Disk Drive, 'Compression' utility to increase the Hard Drive capacity to typically 60Mb, the highly acclaimed Computer Concept's Impression Junior DTP package, EasiWord wordprocessor, Quest for Gold game, applications suite of software packages and comprehensive audio training tape.

RRP: £1095

Sale Offer Price: £765

Above Package plus Acorn's Learning Curve **£879**

Special Education discounts available on micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

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Lease Purchase facility now available. Please telephone or write in for details.

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

- **R300**-4 Layer RAM upgrade board (Bare). £25
- **R302**-A3000 – to 2MB RAM Upgrade £29
- **R303**-A3000 – to 2MB RAM Upgrade (expandable to 4MB) £49
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- **R311**-A305 – to 1MB RAM Upgrade £30
- **R312**-A305/310 – to 2MB RAM Upgrade £99
- **R314**-A305/310 – to 4MB RAM Upgrade £199
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Acorn's Archi DTP Package	£69
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Impression Junior	£69
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Image Writer	£25	EasiWord	£18

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Intersheet Disc	£24	Schema	£89

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GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

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- Pipedream 4 £149
- Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school £75

More Archimedes Products See Pages 3, 4, 5, 6, 7, 8



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Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£195
ADA 0530	100Mb	16mS	£295
ADA 0570	200Mb	15mS	£449
ADA 0580	330Mb	15mS	£799

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000 £85

Internal Hard Disc Drives for A3000

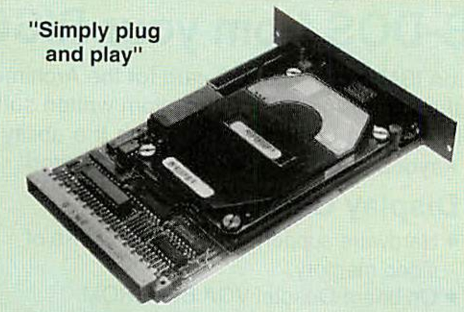
State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0770	30Mb	19mS	£185
ADA 0720	40Mb	19mS	£279
ADA 0750	60MB	18MS	£329
ADA 0730	80Mb	18mS	£399

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug and play"



Watford's easy to instal, low cost, high performance, revolutionary IDE Hard Cards for the A300 & A400 series Archimedes.

ADA 0650	21Mb	23mS	£199
ADA 0800	30Mb	19mS	£195
ADA 0660	40Mb	28mS	£289
ADA 0810	60Mb	18mS	£339
ADA 0670	80Mb	18mS	£409

(Can be used as a Removable Hard Drive)

NEW Archimedes A300/A400 SCSI Hard Disc Offer

(while stocks last)

100MB Hard Disc Upgrade complete with Controller card, Cables, Formatter and Manuals

RRP: £799

Offer Price: £289

Syquest Removable Disc Units

These Hard Drive units are supplied complete with a cartridge 42Mb removable, cables and a high flow fan for cooling.

- Syquest Drive Unit pack £379
- As above + SCSI Card £415
- Spare 42Mb Disc £55

Archi to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version also available (please specify)

- For A3000 £15 • For A5000 £16

For A3000 Serial Upgrade (£19) required

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

Minerva's Archimedes Software

EasyWord	£18	Time Tabler	£549
Home Accounts	£35	System Delta	£59
System Delta Program Reference Manual			£29

Stand alone Business Accounts Packages

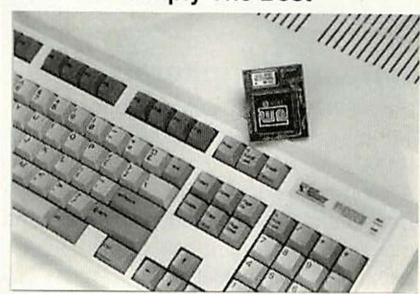
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£79 per module

or Complete Business Package **£325**

ARM 3 Turbo Card MkII

Simply The Best



Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £169. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Offer Price £169

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£375**

FREE with every BBC Master purchased from us during October

A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

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Continued→ → → → → → → → → →

Watford Electronics Aries PC Card

Access the world of MS-DOS from your RISC OS based computer

Watford Electronics brings you a full specification IBM compatible PC card for the Archimedes. You no longer require the Archimedes PC Emulator, all PC software is run locally on the expansion card with custom written software to interface the PC card into the RISC OS environment. The expansion card is a full hardware implementation, with the ability to be turned into an ISA Bus, fully fledged 386 PC just by the addition of a power supply, keyboard, storage device and a monitor!

Processor

386SXL 33MHz low power processor. Socket for optional 387SX 33MHz numeric co-processor.

On Board Peripherals

- Uses 82C107 single chip solution.
- 128 bytes of battery backed CMOS RAM.
- AT compatible Keyboard Controller.
- Uses standard Archimedes keyboard and mouse. Full standard ISA 16 bit expansion bus available.
- Optional expander allows one or two half size PC cards to be installed in the adjacent Archimedes expansion slots.

Memory

- Uses 82C311 memory controller 2Mb zero wait state DRAM as standard, upgradable to 4Mb DRAM just by adding 4 more chips.
- Bank interleaving and page mode memory operation for maximum performance.
- On-board BIOS ROM.

Display Controller

- Hardware support for VGA with 512Kb of video memory.
- On board Quadtel VGA BIOS ROM.
- Multitasking screen display on RISC OS.
- Desktop can be achieved in software.
- Separate VGA monitor can be connected for simultaneous RISC OS and PC display or your Archimedes VGA compatible monitor can be used with optional video switch.
- Much faster and improved video speed compared to PC Emulator.

Hard & Floppy Disc

- Full background disk access, the Archimedes is not adversely affected.
- Any existing Acorn PC Emulator hard disk partition can be used, with the ability to create new PC hard disk partitions on any RISC OS hard disk.
- Optional IDE hard disk and floppy drive option for direct connection of a dedicated hard disk and floppy to PC card.
- Access to the Archimedes floppy disc drive for reading and writing of PC disc formats from PC.

Bundled Software

- MS DOS 5.0, Lotus Works and PC Organiser

Sound

- Uses the Archimedes internal speaker by connecting to the Auxiliary sound connector.

Enhancements

Optional expansion card will be available either hardware parallel and serial ports or the ability to connect an external AT style keyboard and mouse.

The PC card can also be plugged into a stand alone backplane to form the heart of a fully expandable, industry compatible 386SX computer, with no reliance upon the Archimedes.

Specifications may be subject to change. E&OE.

Call, fax or write now for more details!

See us at the Acorn User Show on Stand Nos. 90 to 93 for demonstration.

Scan256 – The only sensible scanner purchase

Scan256 – the innovative 256 grey-level hand scanner for the Archimedes range of micro computers. It offers up to 256 grey levels at a maximum of 400 dpi, and comes complete with the most advanced and sophisticated 256 grey scale scanner software currently available for the Archimedes.

- Multiple copies of the image in memory at once.
- Allows multiple consecutive operations without having to save the original image to disk.
- Instant re-draw of all 4 image buffers.
- No re-calculations needed unlike other packages that use on the fly screen-dithering.
- Highly advanced dithering and image size reduction.
- Available via industry standard Change FSI package for maximum image quality. An invaluable aid to reduce the size of the image whilst maintaining maximum image quality.
- Advanced in-built image processing options.
- Convolution digital filtering fully implemented with over 100 filters covering edge detection, image enhancement and image smoothing. Enables high quality images to be obtained from poor quality scans.
- A unique L.E.D. indicator on the scanner.
- Shows you when the scanner is being moved at close to the maximum scanning speed, not just when it is too late and a scan line has been missed by moving the scanner too fast.
- Fully adjustable scale and size of image preview when scanning
- Hand held scanner image preview window can even be behind other windows and preview is shown in real-time with maximum number of grey-scales available.
- Support for The Serial Port Graphics Enhancer.
- Forthcoming support for the State Machine G8 Graphics Card.
- Allows up to 256 simultaneous grey scales on screen at once.
- True brightness, contrast and gamma correction.
- All can be specified by a value to exactly match monitor/printer. No guessing with shapes of curves and correction is mathematically correct.
- RISC OS 3 features.
- Include rotation and shearing. Scans normally are scanned at a slant rather than being rotated, shearing enables the scan to be corrected better than rotation.
- Fast RISC OS printing.
- Multiple options such as scale to page, centre, sideways selected area, and any scale.
- Scanner scans at an amazing 3ms per line.
- A post card at 400dpi takes only 7.3 seconds to scan, creating over 3Mb of data.
- Selectable scanning modes.
- 256 grey-scale, 256 grey-scale half width, 16 grey-scale and monochrome scanning modes. Half width mode enables longer 256 grey-scale scans to be achieved.
- Save image foreign formats.
- Save as industry standard TIFF for exporting to other systems, AIM for further processing, or RISC OS Sprite format.
- Single width, high quality podule using surface mount technology

The only sensible scanning and image processing solution for the Acorn Archimedes. Just compare the features, there can only be one choice...

Scan256 Scanner, Interface Card, Software and Manual Only £185

Please specify Archimedes type.
Not compatible with A3010, A3020, A4000

Call now for details about our new Scan256 Flatbed Professional Scanner

BBC Education Software

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Espana Viva	Spanish educational programs	£20
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Geordie Racer	Look and read for ages 7+	£22
Hall of Mirrors	Practice word & number skills	£22
Help your child learn basic Mapwork No. 2		£18
Inside Science	Four common science subjects	£22
Letters and pictures	Educational programs for 6-8 years	£15
Make a wildlife garden	Explore wildlife/weather/garden growth	£22
Maths with a story 1	Primary level maths programs	£20
Maths with a story 2	4 further maths programs	£20
Note invaders	Learn sheet music for 7-Adults	£150
Numbers & Pictures	Early number learning (4-6 years)	£15
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Skyhunter	Look and read educational adventure	£22
Technology and design	Problem solving programs	£22
Through the dragons eye	Adventure game and Map reading	£22
Fun School 3 (Under 5)	Varied range of Education subjects	£17
Fun School 3 (5-7)	Varied range of Education subjects	£17
Fun School 3 (Over 7)	Varied range of Education subjects	£17

Archi Educational Software

- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £26
- Craftshop 2 £26
- Converta-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 3 Red (up to 6 years) £17
- Fun School 3 Green (6-8 years) £17
- Fun School 3 Blue (8 years +) £17
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jigsaw £28
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £26
- Space Mission Mada (9-13 yrs) –
- Sting of the Dump (9-13 yrs) £22
- Target Maths £16
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25

Archimedes Software

GRAPHICS

3D Construction Kit	£39
Arc Light	£46
ARCtist	£19
ARCticulate	£19
Art Works	£160
Atelier	£65
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Illusionist	£69
Kermit	£46
Mogul	£17
Poster	£79
Pro Artisan	£70
Prime Art	£69
Render Bender 2	£95
Revelation 2	£80
Snippet	£21
Titler	£119
Tween	£29

GAMES

Air Supremacy	£17
Apocalypse	£14
Arcade Soccer	£14
Boogie Buggy	£14
Break 147 + Supa Pool	£19
Bughunter in Space	£19
Cataclysm	£19
Chess 3D	£16
Chocks Away Compendium	£32
Chocks Away Extra	£14
Conqueror	£15
Corruption	£18
Cyber Chess	£38
Elite	£33
Enter the Realm	£19
E-Type Compendium	£20
E-Type Designer	£13
Family Favourites	£13
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf Comp	£20
Hostages	£14
Inter Dictor 2	£26
Iron Lord	£15
Jigsaw	£27
Lemmings	£20
Lost Temple	POA
Mad Prof Mariarti	£17
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United II	£19
Mig 29	£24
Nebullus	£21
Nevryon	£14
Nevryon II	£20
Olympics	£14
Pandoras Box	£18
Pipe Mania	£17
Power Band	£14
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy	£22
Real McCoy 2	£23
Real McCoy 3	£22
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars Deluxe	£27
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Superior Golf	£14
Superpool + Break 147	£22
Swiv	£19
Talisman	£12
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Wimp Game	£13
Worldscape	£16
XFire	£19
Zelanites	£23

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
Avante Garde Fonts	£23
BBC DFS Reader	£6
Broadcaster Loader	£65
Compression (CC)	£38
Equasor	£38
FlexiFile	£97
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
JX Archi Colour Printer Driver for Citizen & Star Printers	£15
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Prophet	£132
Prophet Demo Disc	£10
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Vox Box	£46
WorldScape	£17

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77 — £77 each
Assembler; LISP; Prolog X — £149 each

Desktop C	£199
Macro Assembler	£40
Robo Logo	£69
BASIC Compiler	£77
Logotron Logo	£45
Risc Basic	£120
Risc FORTH	£110
Cambridge Pascal	£95

Archimedes External Disc Drive Interface

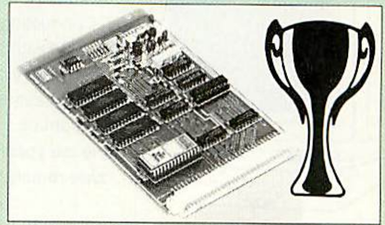
With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

Price £21

Back Plate Extension

- A300/400 £15;
- A3000 £14

Archi Real-Time Digitiser



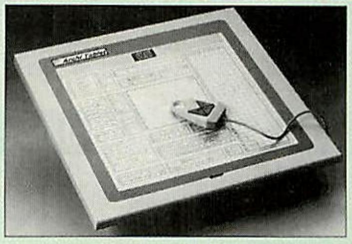
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £119

A Set of Colour Filters for colour image grabbing using a video camera £16

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).
(FREE this month, PC Mouse Drivers & Art package)

Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£20**

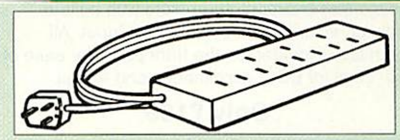
Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £125

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

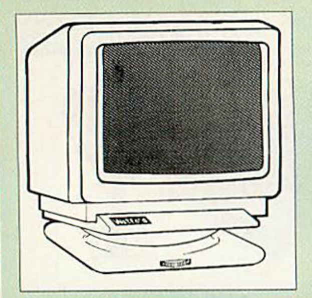
£16

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only £1.00

Continued→ → → → → → → → → →



FREE Connecting lead with every monitor purchased from us. Please specify type required.

Microvitec Monitors

• **1431** – Standard Resolution Monitor	£169
• **1451** – Medium Resolution Monitor	£209
• **Cub3000** Medium Res for A3000	£189
• Dust Cover for Microvitecs	£5.50
• **Touchtec 501 Touch Screen**	£239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

• Eizo 9060S	£389	• NEC 6FG	£1525
• Eizo F550i	£725	• Taxan 770LR	£362
• Eizo T560i	£995	• Taxan 787	£249
• Eizo T660i-T 20"	£1599	• Taxan 795	£397
• NEC 3FG	£370	• Taxan 875	£679
• NEC 4FG	£465	• VIDC Enhancer	£25
• NEC 5FG	£850		

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes. **£325**

• Aries Alphascan 17" Plus £495

Philips Monitors

• **BM7502** 12" Hi-res Green Monitor	£67
• **CM8833** 14" Med. Res Colour Monitor	£172
• Dust Cover for Philips Monitors	£6

STAR BUY
Philips CM8833 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video input. All controls are located on the front panel for ease of use. Ideal for BBC, Archimedes and Amiga.

Only £159

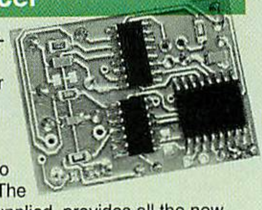
Spare Monitor Leads

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

Integrex Ink Jet Printers

• Colour Jet 132 Printer	£425
• Integrex Betajet	£185
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge	£21
• Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123
• Colour Jet 2000	£529
• Betajet Ink Jet Printer	£185
• Betajet Cut Sheet Feeder	£43

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

SPECIAL OFFER

• **Desk Jet 500 Mono Printer**	**£264**
• **Desk Jet 500 Colour Printer**	**£344**
• **BJ10EX + Turbo Driver**	**£192**

- Above prices include 3 years extended parts and labour warranty at no extra cost to you.
- At an additional cost of £45, we will convert the above warranty to 3 years on-site warranty.
- Archimedes Printer Driver for DJ 500 Colour Printer £15 (P.S. DJ 500 mono no driver required)

Panasonic Printers

KX-P1123	£126	KX-P2180C	£146
KX-P1124i	£170	KX-P2123C	£197
KX-P1170	£99	KX-P2180M	£156
KX-P1624	£250	KX-P2123M	£176
KX-P1654	*£332	Colour Kit for P2180M/2123M	£–
KX-P1695	£267		
KX-P2624	*£268		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i £79 **P37** – 1123/70/80 £69
P38 – P1624/95; P2624 £129

Buffers

P12 4K Buffer Board for KX-P1081 £55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95 £16

Serial Interfaces

P13 for P1123/24/24i/70/80/1624/54/95/2624 £49

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595 £6
P115 for KX-P1180 £7 **P145** for KX-P1124 £7
P140 for KX-P1540 £8 **P155** for KX-P1624 £8
Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red £9 each
P150C Colour for P2123/2180 £15

Citizen Printers

• 120D Plus	£95	• Swift 24E#	£195
• 224	£174	• Swift 24X	£299
• 240 Colour	£212	• 24X Colour Opt	£32
• PN-48	£199	• PN48 Ribbon	£4
• Swift 9	£145		

• AH29804 Manual Cut Sheet Feeder for Swift 9/24/124. Holds 50 Sheets £29

\# FREE Colour Option with Swift 24E
\+ FREE 2 years Parts and Labour warranty on all Citizen Printers

• Swift 9 Colour Option		£19
• Swift 24 Colour Option		£29
• Swift 24 Ribbons	Black £4	Colour £13
• Swift 24X Ribbons	Black £8	Colour £16
• Citizen/Archimedes Colour Printer Driver		£15

Roland Plotters

• DXY1100	£488	• DXY1200	£620
• DXY1300	£825	• DXY2500	£2345
• Sketchmate A3	£499	• Sketchmate A4	£308
• Roland plotter Pens, Fibre tip			£7.50

Star Printers

LC15	£168	LC200 Colour	£140
LC20	£99	SJ48 Inkjet	£165
LC100 Colour	£136	XB24-200 Colour	*£288
LC24-15	£233	XB24-250 Colour	*£350
LC24-20	£148	XB24 Colour kit	£29
LC24-100 Colour	£162	ZA200 Colour	*£230
LC24-200	£162	ZA250	*£295
LC24-200 Colour	£205		

• Star/Archimedes Colour Printer Driver £15
* Includes 12 months On-site warranty

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15 £52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200 £55

Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL-4	4ppm	£490
Brother HL4-V	4ppm	£639
Brother HL4-PS Postscript	4ppm	£970
Brother HL8-V	8ppm	£895
Canon LBP4 LITE	4ppm	£479
Canon LBP4+ 1.5M RAM	4ppm	£632
Canon LBP-8III Plus	8ppm	£945
Epson EPL4300	4ppm	£570
Epson EPL4000	6ppm	£475
Epson EPL7500	6ppm	£1139
Epson EPL8100	10ppm	£939
HP Laserjet IIP+	4ppm	£530
HP Laserjet III	8ppm	£1009
HP Laserjet IIID	8ppm	£1487
HP Laserjet IIIP	4ppm	£685
HP Laserjet IIIsi	16ppm	£2510
NEC Silentwriter S62P P/script	6ppm	£1059
NEC Silentwriter 266	8ppm	£669
NEC Silentwriter 290P P/script	8ppm	£1369
Panasonic KX-P4410	5ppm*	£519
Panasonic KX-P4420	8ppm*	£615
Panasonic KX-P4430 Satin Print*	5ppm*	£586
Panasonic KX-P4451	11ppm*	£1085
Panasonic KX-4455 Postscript	11ppm*	£1444
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£890
Star LP-8 Star(post)script	8ppm	£1130
Star LP-4	4ppm	£565
Star LP-4 Mk 3	4ppm	£589
Star LP-4PS Postscript	4ppm	£769

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Star LP4/LP8	£56
Epson GQ	£13	KX-P4420/50	£19
EPL 4100	£69	Laserjet HP IIP & IIIP	£42
EPL7100/7500/8100	£125	Laserjet II/D, III/D	£48
		Qume Crystal (3)	£58

Laser RAM Upgrades

IIP; III/P 1Mb	£49	EPL7100 256K	£39
IIP; III/P 2Mb	£80	GQ5000 512K	£42
IIP; III/P 4Mb	£132	KX4420/50 1M	£75
II & IID 1Mb	£60	KX4420/50 2M	£115
II & IID 2Mb	£96	KX4420/50 4M	£195
II & IID 4Mb	£142	Star LP8 1M	£139
Canon LBP4 1M	£105	Star LP8 2M	£275
Canon LBP8 2M	£125		

Laser Drum & Developer

• Epson Drum GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum	£60	Developer	£59
• Panasonic 4450 Drum	£93	Developer	£80
• Qume Drum	£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III £225 IID & IIID £227

Various Add-Ons

• Laserjet Appletalk Interface	£135
• HP Adobe Postscript	£399
• Pacific Page Postscript	£259
• HP Premier Font Collection	£28
• Laserjet various Font cartridges	from £45
• Canon LBP-4 Lower Cassette Tray	£75

Hewlett-Packard Printers

# Desk Jet 500	£264	*Paintjet XL	£1196
Desk Jet 500 Colour	£345	*Quiet Jet Plus	£382
Desk Jet 550 Colour	£442	*HP Think Jet	£265
*Paint Jet Colour	£518	*HP Deskwriter	£299

3 years extended Parts & Labour warranty **FREE**
* Price includes 12 months on-site warranty

- DeskJet 500 Cart. Black **£14;** Colour **£23**
- Paintjet Cartridges Black **£19;** Colour **£23**
- Desk Jet 500 256K RAM cartridge **£69**
- HP Epson FX Emulation Cartridge for Desk Jet **£59**
- DJ 500 High Capacity Black Cartridge **£21**
- DJ 500 Colour Archi Printer Driver **£15**

Plug In Font Cartridges for DJ 500

- 22706B – Prestige, Elite, Line Draw fonts **£55**
- 22706C Letter Gothic & HP Line Draw fonts **£56**
- 22707P – Proprint Emulation Cartridge **£57**
- Desk Jet Unlimited (Book No VAT) **£19.75**

Canon Bubblejet Printers

	Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	£160	£43	–	£16
BJ20	£248	–	–	–
BJ300*	£284	£88	£65	£12
BJ330*	£373	£110	£79	£12
BJC800C	£1355	–	–	–

* Includes 12 months On-site warranty

- Spare Battery pack for BJ10E **£33**
- BJ10EX – Archi Turbo Driver **£42**

Special Offer:
Canon BJ10EX Printer + CC's Turbo Driver **£210**

NEC Pinwriter Printers

- P20 **£178** • P70 **£396**
- P30 **£237** • P90 **£605**
- P60 **£322**
- P60/70 Colour Option Kit **£59**
- Ribbons Black for P20/30 **£6** for P60/70/90 **£7**
- Ribbons for P60/70/90 Black **£9** Colour **£13.50**

Cut Sheet Feeders
P20 **£59;** P30 **£85;** P60 **£89;** P70/90 **£80**

Epson Printers

DFX5000	£1069	LQ1170	£429
DFX8000	£1920	LQ2550+	£669
FX850	£135	LX400	£90
FX1050	£322	LX850+	£134
LQ100	£144	LX1050	£199
LQ570	£197	SQ870	£409
LQ870	£352	SQ1170	£560
LQ1060 Colour	£588	SQ2550	£669
LQ1070	£308		

- Tractor Feed for LQ100 **£29**
- Original Ribbon for LQ100 **£6**

Cut Sheet Feeders for
LQ570, LQ870 **£47**
LX400/850/LQ200/400/450/500/550 LQ1010/1070/1170 **£72**
LX1050 **£115** FX850/LQ860 **£128**
FX1050/LQ1060/SQ850 **£155**
LQ2550 **£299** SQ2550 **£210**

Tractor Feed for
LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

- EX800/1000 Colour Option **£45**
- EX800/1000 Colour Ribbon **£14**
- LQ2500 Colour Option **£65**
- Multifont Card for LQ550/850/1050 **£95**

Epson Printer Interfaces
RS232 **£28** RS232 + 2K Buffer **£52**

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£5
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
RS232 Leads (Various)	P.O.A.

Laser Direct

- Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers **£315**
- LPB 4 Printer plus High Res Card **£945**
- LPB 8III Printer plus High Res Card **£1275**
- LPB 4 Optional Paper Tray **£79**

Fujitsu Printers

B-100	£205	DL1100	£217
B-200	£270	DL1100 Col	£267
DL-900	£181	DL1200	£363

Ribbons
DL900/1100/1200 Mono **£5** Col. **£11**
B-100/200 Ink Cartridge **£15**

Concept Keyboards

Standard A3 Keyboard with BBC Software	£138
Standard A4 Keyboard with BBC Software	£109
Archi A3 Keyboard	£139
Archi A4 Keyboard	£110

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper **£7**
- 2,000 Sheets 9.5" x 11" Fanfold Paper **£11**
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold **£21**
- 1,000 Sheets 15" x 11" Fanfold Paper **£9**
- 2,000 Sheets 15" x 11" Fanfold Paper **£16**
- 1,000 Sheets true A4 Fanfold Paper 70gms **£11**
- 2,000 Sheets true A4 Fanfold Paper 70gms **£21**
- Teleprinter Roll (Econo paper) **£4**
- Telex Roll 50 metre **£3**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).
Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	£6.00
1,000 off, 90 x 36mm (Twin Row)	£6.25
1,000 off, 90 x 49mm (Twin Row)	£7.50
1,000 off, 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

3750 off, 70 x 29mm (3 Rows x 10)	£15.50
2400 off, 70 x 37mm (3 Rows x 8)	£15.25
2625 off, 70 x 42mm (3 Rows x 7)	£15.00

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.25	£4.50
DMP2000/4000	£3.75	£4.95
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£12.00	–
LX80/86	£2.75	£4.50
LX400/800/850	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£6.00	£5.00
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

Professional Type

Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

Auto Printer Sharer

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	–	£89

256k Multi Spooler

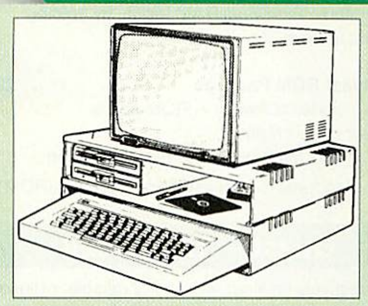
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

- 2 In/2 out **£135** • 4 In/2 out **£169**
- 8 In/1 out **£199**

Compact Converter Units

Serial to Parallel **£36** Parallel to Serial **£37**

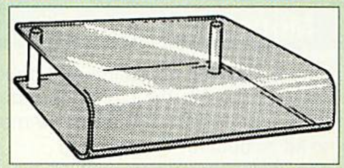
Plinths for the BBC B, BBC Master & A3000



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

- Single BBC Plinth 420 x 310 x 105mm **£13**
- Double BBC Plinth 420 x 310 x 210mm **£24**
- Single Master Plinth 490 x 310 x 105mm **£14**
- Double Master Plinth 490 x 310 x 210mm **£26**
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive **£15**

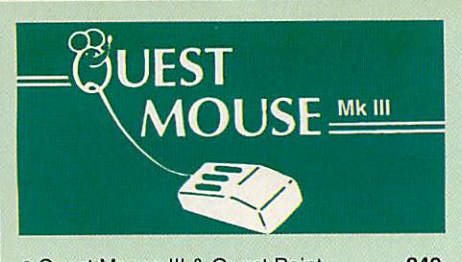
Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version **£16** (carr £3)
136 Column version **£20** (carr £4)

Continued→ → → → → → → → → →



- Quest Mouse III & Quest Paint £49
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £69
- Quest Mouse III only £25
- Quest Paint Software only £28
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

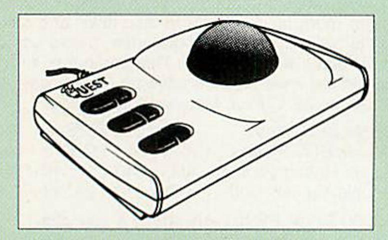
ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £28
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)
(P.S. Conquest is a Quest Paint extension ROM).

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version **£25**
QT-20 Archimedes Version **£26**

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

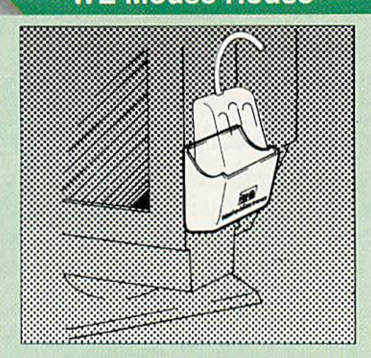
Mk III AMX MOUSE

- **AMX Mouse plus Super Art £49**

(Please specify for BBC, Master or Compact)

- AMX MOUSE ONLY £25
- AMX SUPERART Package £26
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £25
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £29
- AMX EXTRA EXTRA £16
- MOUSE MAT £3

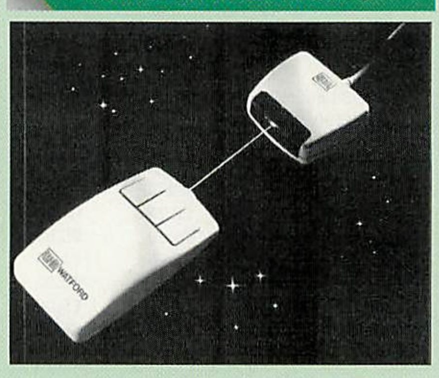
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

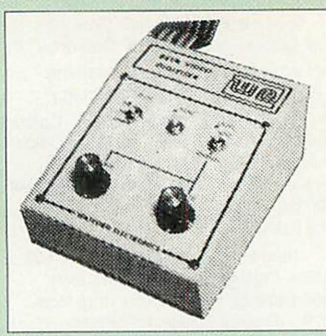
Archi Cordless Mouse



Features
- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £39

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.
Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

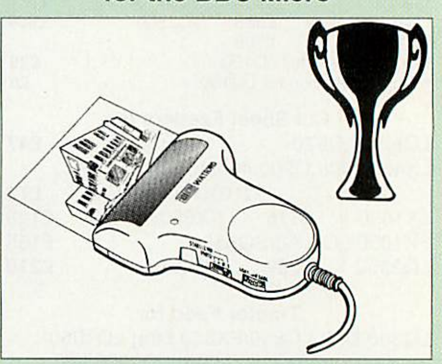
£99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Beeb Hand Scanner

Hand-held Scanner for the BBC Micro

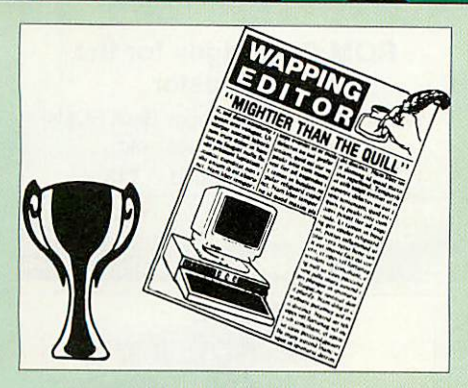


Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware £99



Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.
Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack	**£49**
Wapping Editor plus Mouse	**£69**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

£13

Archi A4 Scanner

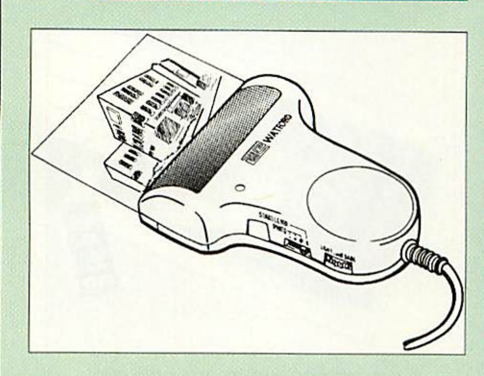


This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the !HELP application on the Acorn applications discs. The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.
Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.
All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

New Low Prices:

Archi A4 Scanner	£269
Sheet Feeder for above	£75
Scanner + Sheet Feeder	£359

Archi Mk II Hand Scanner



Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines.
Images can be printed on any printer supported by RISC OS.
On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version	**£109**
AHS-3 Archi A3000 Version	**£119**

Z88 Portable Micro



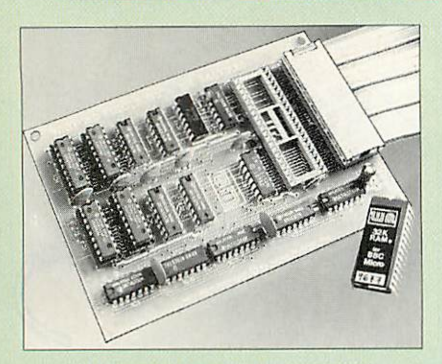
• Z88 Portable Micro	£169		
• 32K RAM Pack or 32K EPROM Pack	£16		
• 128K RAM Pack or 128K EPROM Pack	£32		
• 512K RAM Pack	£86		
• 256K Eprom Pack	£55		
• Z88 Eprom Eraser Unit	£38		
• Z88 Carrying Case	£8		
• AA Nicad Rechargeable Battery	£1.50		
• Battery Charger Compact & Fast	£6		
• Z88 Serial Printer Cable	£8		
• Z88 Parallel Printer Cable	£18		
• Z88 to Archi Link	£15		
• Z88 to BBC Link	£8	• Z BASE	£56
• Z88 to PC Link II	£27	• Z88 to Macintosh	£32
• Z88 Mains Adaptor	£9	• Z88 Modem	£114



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Continued→ → → → → → → → → →

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

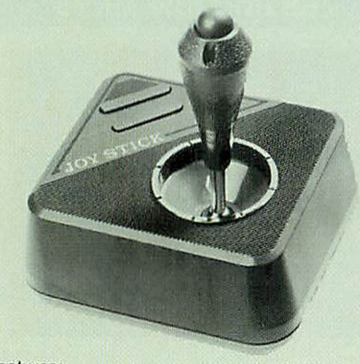
Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

Only £49

- **ARIES B-32 Shadow RAM Card £49**

Commander Joystick



Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

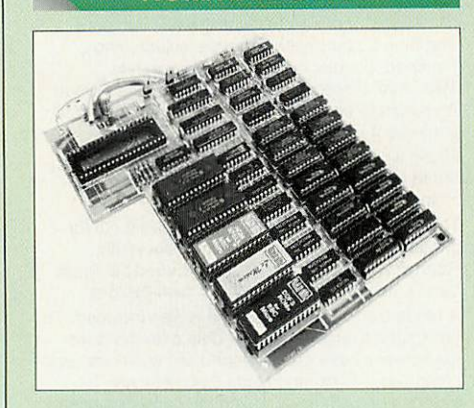
Price: £15

(PC version of above joystick available at £16)

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24
Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128	£25

ROM/RAM Card



- NO SOLDERING required to fit the board.
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM.
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

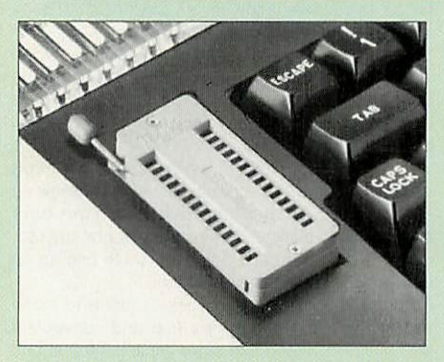
PRICES:

• ROM/RAM card with 32k DRAM	£39
• ROM/RAM card with 64k DRAM	£52
• ROM/RAM card with 128k DRAM	£83

OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£8
• 16k DRAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£109

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs.

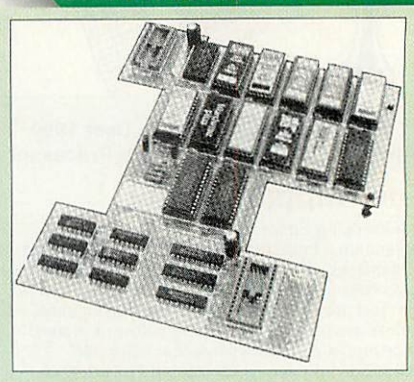
£18

ROM Cartridges for the BBC Master

Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

• Twin **£8;** • Quad **£13**

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32

Battery Backup fitted **£35**

Battery Backup only **£3**

16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

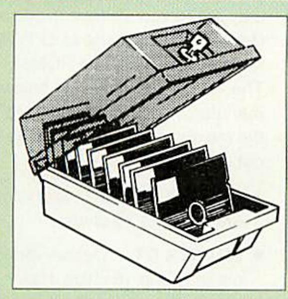
Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK £8

Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs £4.95
- **M85** – holds up to 95 5.25" discs £6.95
- **M25*** – holds up to 25 3.5" discs £4.95
- **M50** – holds 50 3.5" discs £6.50
- **M100** – holds 100 3.5" discs £6.99
- **M10** – holds 8 of No. 10 Data Cartridges £15

* Not lockable

Disc Plonker Rack



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**



3M – Diskettes

Lifetime warranty on 3M Discs

- *10 x 5.25" S/S D/D 40T (744)* £5
- *10 x 5.25" D/S D/D 40T (745)* £5
- *10 x 5.25" S/S D/D 80 Track (746)* £7
- *10 x 5.25" D/S D/D 80 Track (747)* £7
- *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT* £8
- *10 x 3.5" S/S D/D 40/80 Track* £6
- *10 x 3.5" D/S D/D 40/80 Track* £6
- *10 x 3.5" Double Sided High Density* £11



Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

- *10 x **M3** 3.5" D/S D/D 80 Track* £6
- *10 x **M9** 3.5" D/S High Density* £10
- *10 x **M4** 5.25" S/S D/D 40 Track* £5
- *10 x **M5** 5.25" D/S D/D 40 Track* £5
- *10 x **M7** 5.25" D/S D/D 80 Track* £6
- *10 x **M8** 5.25" D/S H/D Hi-Density* £9
- ***M2** 3" Double Sided* £2.50 each

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£25	£30	£35
• With Sleeves 5.25"	£28	£33	£38
• 3.5" D/S D/D	£21 for 50		£39 for 100

3.5" Disc Drive



These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	£59
• **CLD35:**	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	£82
• **CD35:**	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



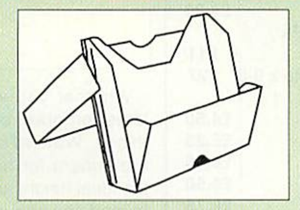
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



- **DLC1** – Holds 5 x 3.5" Discs. £1.50
- **DLC2** – Holds 10 x 3.5" Discs. £1.90
- **DLC3** – Holds 5 x 5.25" Discs. £1.60
- **DLC4** – Holds 10 x 5.25" Discs. £2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

- **DW1** – Holds 6 x 3.5" Discs £2.50
- **DW2** – Holds 6 x 5.25" Discs £3.00
- **DW3** – Holds 20 x 5.25" Discs £3.50
- **DW4** – Holds 40 x 3.5" Discs or 5.25" Discs £4.50

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

- Watford sophisticated DFS ROM £16.00
- Watford DFS Kit complete £49.00
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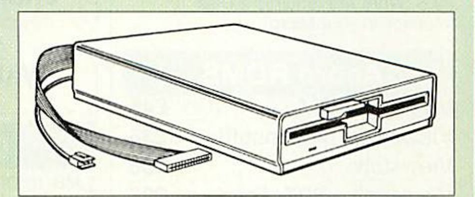
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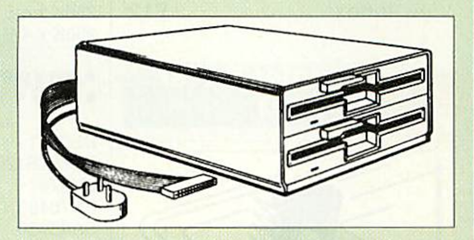
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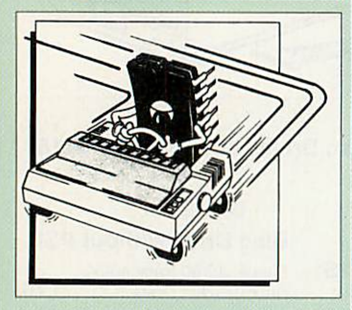
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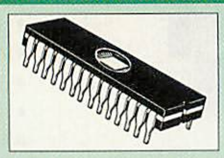
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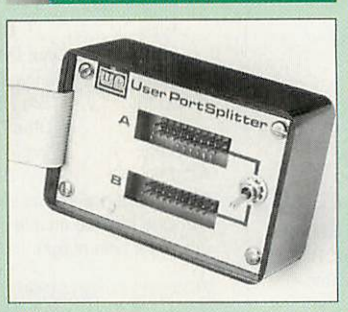
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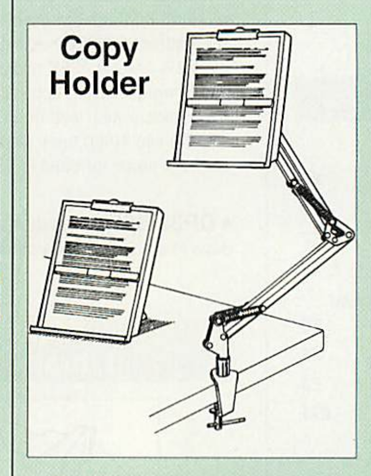
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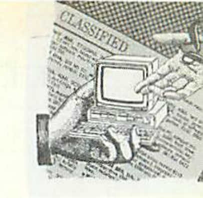
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● A3000, colour monitor and stand, excellent condition, original manuals and discs – £600. Contact Mr K Sharman, Oxford. Tel: (0865) 862143

● A3000, 2Mb, Philips colour monitor, serial chips, digitiser, monitor stands, lots of PD software, manuals, still boxed, excellent condition – £700 ono. Contact Mr C Senior, Newport. Tel: (0633) 894533

● A3000, 2Mb base, user port/midi upgrade, plenty of software and games, excellent condition – £420. Contact Mr B Barter, Exeter. Tel: (0392) 67009

● Star LC-10 printer, unused, boxed, suitable for BBC B/Master, Archimedes – £50. Contact Mrs E Dean, Salisbury. Tel: (0980) 620356

● Illusionist – £65, Gods – £20, Swiv – £17, Lemmings – £15, Cataclysm – £15. Contact Mr E West, Loughton. Tel: 081-508 7648

● Music 5000 for Master, 2x16k Rom cartridge for ample Rom, Cosmix album, excellent condition – £80 ono, Peartree MR8000 2x32k battery backed up protectable Ram cartridge – £20 ono. Contact Mr J Mulvey, Sussex. Tel: (0342) 870305

● BBC Master, disc drive, printer, mouse, Ramrod, manuals, software, games etc – all for £275 ono. Contact A Farooq, Doncaster. Tel: (0302) 342256 after 6pm

● Z80 2nd processor with original CP/M software and many utilities – £55, Juki 6100 Daisywheel printer, high quality print, many fonts – £55. Contact Mr N Bayley, Farnborough. Tel: (0252) 510486

● Master 128, single 40/80 drive, colour monitor, Star SG10 printer, Stop Press and software – £350. Contact Mr T Underwood, Cheltenham. Tel: (0242) 580209

● Wanted: Archimedes A5000 with or without monitor, any condition considered, cash waiting, distance no problem. Contact Mac Rai, Derby. Tel: (0332) 281540

● Wanted: Printing aid for BBC B+128, Printwise, Stop Press, Fleet Street, Editor, etc. Contact G D Alliban, Bath. Tel: (0761) 471162

● Archimedes 410, 4Mb, 40Mb hard disc, Arm 3, Acorn monitor – £950, buyer collects. Contact Mr A Warrey, Co Durham. Tel: 091-5817145

● Hybrid Music 5000 synthesiser, Music 4000 synthesiser keyboard and manuals, for BBC B/Master – offers. Contact Mr A Blandamer, Stratford-on-Avon. Tel: (0789) 267893

● For sale: Schema, Poster, Hot-link Presenter, 1st Word Plus V2, Genesis Plus, Hewlett-Packard DeskJet Plus, Lingenuity Scsi card (A3000) – sensible offers. Contact Mr J Ward, Surrey. Tel: 081-395 6425

● Swap Real McCoy for Real McCoy 2. Contact Mr A Cooper, Stevenage. Tel: (0438) 749968 eve or weekends

● Wanted: Laser Direct hires card. Contact Mr I Ford, Manchester. Tel: 061-431 5985

● A3000, 2Mb Ram, 5.25in disc interface and loads of software – £650. Contact Mr C Richardson, Kent. Tel: 081-310 6647 after 6.30pm

● A3000 and Archimedes games for sale, includes Arcade Creator, Lemmings. Write for list to Mr I Vincent, 42 Elm Avenue, East Leake, Lougborough LE12 6QJ

● A310, colour monitor, Risc OS, covers, some software, manuals and mags – £500 ono. Contact Ricky Ford, Milton Keynes. Tel: (0908) 320695 evenings

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● Wanted: Plus 1 interface for Electron. Contact Mr C Brown, Merseyside. Tel: 051-489 7426. Phone before noon.

● Wanted: Risc User up to and including volume 5 issue 9 plus discs if possible. Contact G Horsington, Gwent. Tel: (0873) 853538

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● Colour Kit (ribbon and motor) for Citizen Swift 24 printer, new and unopened – £20. Contact Mr H Holland, Caernarpon. Tel: (0286) 830849

● Archimedes software for sale: Artisan, Interword, UIM – £8 each, Rotor, Repton 3, Mad Professor, Worldscape – £5 each. Contact Mr P McBrien, Maidenhead. Tel: (0628) 39430

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● Archimedes 420/1, 20Mb hard drive, 2Mb Ram, colour monitor, manuals, software, 1st Word Plus, games, reference manuals, immaculate condition – £950 ono. Contact Mr C Dean, Salisbury. Tel: (0980) 620356 eve

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● 20Mb internal hard drive and Acorn hard disc, Podule (not suitable for A3000) – £160. Contact Mr N Newman, Kent. Tel: (0322) 862397

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● BBC B, Cub colour monitor, 40/80 track 5.25in disc drive, Panasonic KX-P1180 printer – £300. Contact Mr P Lofthouse, Carrington. Tel: 061-775 5917

● Armadeus: Sound sampling software by Clares for the Archimedes/A3000: unregistered, unwanted gift, cost £80 – will accept £49. Contact Mr L Deane, Liverpool. Tel: 051-546 1543

● Wanted: Beebug 0137 Scsi upgrade for 0135 disc interface for A3000 or would consider 0136 A3000 disc interface with Scsi. Contact F Startin, Solihull. Tel: 021-742 2002

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● Panasonic 1124 printer (24-pin) with 10 ribbons, as new – £150 ono. Contact Mr R Barlow, Manchester. Tel: 061-445 3369

● A3000 2Mb, CM8833-11 monitor, printer, RC Video, software, mags and books also accessories worth well over £1600, reluctant sale, GRFS – offers. Contact Mr N Smith, 4 Mortimer Street, Leominster, Herefordshire HR6 8PH.

● A3000 computer 1Mb Ram, monitor, software etc, condition as new – £550, Benson (OCE) A3 plotter – £300. Contact M Snowdon, Exeter. Tel: (0392) 860415

● Anyone interested in swapping PD or programming tips? Please contact Mr S Lidder, Ilford. Tel: 081-518 5579

● A3000, 2Mb Ram, Phillips colour monitor, Pres stand, original manuals and application discs – £650 ono. Contact Mr A Francis, Barnsley. Tel: (0226) 205171

● Acorn multisync monitor (AKF18) excellent condition, hardly used, original box and leads – £200. Contact Mr M Collier, Canterbury. Tel: (0227) 767520

● Electron 64K – £30, Plus 3 and 55 discs – £80, Plus 1 – £10, Rombox – £10, S/W Ram cartridge – £10, other items, phone for list. Contact Mr C Oliphant, Kent. Tel: (0227) 368287

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● Archimedes 310M, 2x3.5in disc drives, 40Mb hard disc, 4Mb Ram, Epson printer, PC Emulator, Romboard, Interword, Spellmaster, plus more – £800. Contact Mr A Brion, Sunbury. Tel: 081-890 2662

● Master 128k, twin 40/80drives, 9 pin NLQ printer, mouse, TV/monitor, software, mags – £500 ono. Contact Mr T Sov, Cheshire. Tel: 061-941 4214 eve

● A310 colour second floppy drive, Rom/Ram, podule, some software – £600, Yamaha PSS780 keyboard, Acorn Midi podule, Studio 24+ – £250. Contact Mr A Bissex, Bristol. Tel: (0761) 452356

● BBC B with floppy drive, Challenger, 256k Ram drive, Wordwise, Watford Ram card, lots of software, mouse, joystick, manuals – £325. Contact R Pennicott, Reading. Tel: (0734) 441898

● Electron Plus 1, Pres Plus 3, 3.5in disc drive, games, books, Starstore Rom view, T2P3 Rom, many games on disc – £200. Contact Mr D Richards, Hoddesdon. Tel: (0992) 447290 after 6pm

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● Archimedes A440/1 with colour monitor, 50Mb hard disc and 4Mb of Ram – £1100. Contact Mr S Beck, Sidmouth. Tel: (0395) 512413

● BBC B, disc drive, Enigma disc manager, View wordprocessor, joystick, lots of software including Nevryon, PIAS 14, good selection of related books – £160. Contact Mr N. Smith, Perth. Tel: (0738) 29843

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● Star Gemini-10x printer with manuals – £50 perfect, just updated to BJ-10ex. Contact Mr R Loveday, Worthing. Tel: (0903) 877222

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● A3000 serial upgrade for sale, never used, brand new – £12.50 or swap for original Pacmania or Lemmings disc. Contact Mr M Kohut, Derbyshire. Tel: (0773) 829217

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● Acorn A440/1 for sale, 15 months old, full system plus PD software – £1100 or nearest offer. Contact Mr D King, Brewood. Tel: (0902) 850605

● Wanted: Morley Teletext adaptor with ATS Rom, for BBC B, also Roms or cartridges for Electron. Contact P Hopkins, 40 Grange Close, Condover Shropshire.

● Watford ST506 hard disc controller podule as new, cost £115, sell for – £45. Contact Mr K Rafiq, Livingston. Tel: (0506) 440238

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● Elite, Saloon Cars Deluxe, Break 147, Superpool (all hard disc installable) and Pandoras Box – £10 each, Zarch – £5. Contact Mr A Taylor, Kent. Tel: (0634) 575841

● Archimedes owners: Join the latest club, for information disc send £1 and SAE to Mr J Brett, 58a Branksome Drive, Nabwood, West Yorks BD18 4BE

● Laser Direct printer with toner cartridges and spare drum, home use only – £650 ono, buyer collects. Contact Mr R Clayton, London E10. Tel: 081-558 5698

● Wanted: Spellmaster for BBC B. Contact J Allen, Bracknell. Tel: (0344) 422614

● Wanted: A400 I/O podule also PCB Pro Schematics. Contact Mr J Manning, Preston. Tel: (0772) 824095

● BBC Master 128, Cub monitor, Viglen 40/80 dual disc drives in own plinth, Citizen 120D printer, Mini Office Rom, etc – £300. Contact G Singh, Leics. Tel: (0509) 650248

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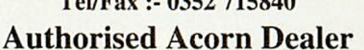
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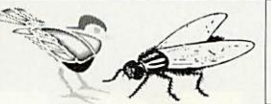
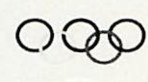
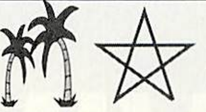
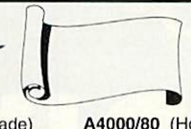


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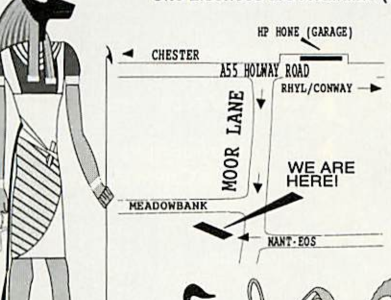
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!Charges	An application to monitor time spent on a job and calculate charges for it. Various currencies.	**Richard G. Hallis**
!Locomo	A full technicolor motion picture. The great train robbery takes place on your iconbar. Top Class.	**Dirk-Willen van Gulik** **Jan Tijmen van Gulik**
!NotSpInv?	Shoot 'em up. 9 levels with mode 15 graphics.	**Paul Hallam**
!SampConv	Multi-purpose sample converter. An excellent utility.	**Matthew Farrow**
!STJukeBox	STmodule player with multi-play & load in a window.	**Ben Brown**
Gangster	A Bitmap 12pt outline font family with four styles.	**Richard G. Hallis**
Shorts	Five small basic programs with amazing results.	**Various authors**
SwirlInMist	A very good STmodule to use with !STJukeBox.	
Zarchars	Arc Angles demo called 'Swiss Section'.	**Arc Angles**
SolidDrag	Enables A5000 owners to 'solid drag icons'.	**Bob Harding.**

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DOTTY DEALS

In an age of cheap laser technology, dot-matrix printers can still offer value for money. Mel Brown looks at the best buys

Dot-matrix printers are here to stay – for a few years at least. Although laser printers and ink-jet machines can produce far superior results, there is nothing yet that can beat a dot-matrix printer when it comes to versatility of paper handling and cheap running costs. In fact dot-matrix printers still account for about half of all printers sold.

Print from inkjet and laser printers is, in almost every case, of superior quality since characters are made up of more dots, more evenly formed and more accurately placed on the paper.

But in their 'near letter quality' mode dot-matrix printers are capable of pretty good print. It takes much more than a casual glance to tell that a letter printed by a good 24-pin printer was not produced on a typewriter.

And print quality, although nice, is not always so important. If you're just using a printer for program listings, so long as they're readable, speed and price are likely to be the crucial factors. School work, personal letters and even business accounts or stock reports do not require the best print. It is the content rather than the presentation that counts.

Laser printers win hands down when it comes to speed. Even in their crude 'draft' print mode, few dot-matrix printers can turn in much over 250 characters per second (about 5 pages a minute) – a poor turn of speed for a laser printer. But, again, speed of printing is not always the overriding consideration. The speeds quoted by manufacturers bear little resemblance to anything real, so the speeds quoted here are actual measured speeds that can be directly compared.

The biggest reason for the longevity of this most ancient of printer technologies is cost – and not just the cost of buying the printer. Although dot-matrix printing is still the cheapest technology, prices for laser and inkjet machines are dropping all the time.

However, both laser and inkjet printers are horrendously expensive to run. Prices of three to four pence per page for running a laser printer are common and for inkjet machines the page cost can be as high as 15p. Dot-matrix printers are so cheap the cost of printing a page is almost negligible. It is the paper itself that provides the primary cost. When a printer is used to churn out experimental data, monthly accounts or the 17th report draft, the price per page counts and the quality of print is pretty unimportant. Business letters and serious DTP are best handled by the elegant output of inkjet and laser machines, but even here dot-matrix can make inroads. Tricky paper handling (for example, making up envelopes for a mailshot) can be dot-matrix territory. For the most part, an inkjet or laser printer that can match the flexibility of paper handling routinely encountered on many a 24-pin printer is hard to find. These machines can handle all manner and sizes of continuous and cut sheet paper, often up



The Swift 240C: a mid-range printer that can even manage a spot of colour

to 16in across – ideal for printing spreadsheets. We looked at a number of printers to suit all pockets, and came up with some good buys in each range. The prices quoted here are all those recommended by the manufacturers. Searching the shops and the adverts will in every case produce considerable discounts.

BUDGET PRINTING

A popular price for home users is up to £300, especially for school and business users who need large numbers of printers or as secondary machines to stand cheaply in for an laser printer. For this price, you are largely limited to a nine-pin machine. 24-pin printers are sold in this price bracket but the improvement is mostly notional. Nine-pin machines cannot produce the best print and, since NLQ printing requires two passes of the printhead for each line, they are tediously slow.

Nine-pin printers usually follow just Epson's FX control code standard or IBM's Proprinter. Either is fine for eight-bit owners, since most software is written with them in mind. Archimedes users will find the dot-matrix printer driver copes admirably.

Despite their shortcomings, these machines still have the flexible paper handling, ease of use and, above all, the incredibly small running costs.

MIDRANGE PRINTING

The heartland price range of dot-matrix printers is between £300 and £450 and, for most users, it is here that going for dot-matrix technology pays off. These printers are capable of print quality quite fine enough for any private use and are even good for casual commercial letters, handouts and so on. Even when printing graphics, these machines can produce quite acceptable DTP pages.

They are all 24-pin printers which produce better quality NLQ print than nine-pin machines in just one pass – so they're faster. Machines in this range also offer a number of NLQ fonts, easy paper handling and all manner of convenience features that were once only found on truly costly machines.

BUDGET PRINTERS

EPSON LX-400 £169

For a machine of this price, the LX-400 is well made to a sensible, practical design. Both cut sheet and fanfold paper can be used but the tractor unit must be removed when using cut sheets. This is more annoying than catastrophic, but the tractor unit is also a pull-feed type, so it's rather wasteful on paper.

The draft print is clearly readable, if unexciting. NLQ print (as shown opposite) is quite unexpectedly good – dark, crisp and well formed. Two NLQ fonts



```
!"£$%&´()*+,-./012345
6789:;<=>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZ[\]^_
`abcdefghijklmnopqrst
```

are built-in, so some document creativity is easily possible. For this price, the LX-400 is relatively fast too. In draft mode it manages a healthy 101cps and, in NLQ mode, characters are produced at a rate of 23cps – approaching two minutes for each page of text.

Only Epson emulation is provided – a level roughly equivalent to the FX standard, but with the expanded IBM character set.

The initial set up is performed with fiddly Dip switches but temporary changes can be made with the front panel, although these are quite complicated for some operations, and force you to count the number of beeps to see what you've selected.

The LX-400 is clearly not the best printer available but at this price, it is quite a bargain.

STAR LC-200 £259

Star is well-known for its long-established line of innovative good low-cost printers. The Star LC-200 is no exception to the rule, and it even prints in colour into the bargain.

A tractor unit is built into the back of the printer and, unusually, this can be switched to pull-feed. Fanfold paper can be 'parked' and cut sheets are loaded automatically.



```
♥♦♣♠!"#$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
\]^_`abcdefghijklmnop
```

The LC-200 can print in three qualities – NLQ, draft and high-speed draft. Both draft prints are excellent and allow speeds of up to 116cps.

The NLQ (shown above) is exceptional for a nine-pin printer and available in four fonts at a speed of 30cps. Both Epson FX and IBM Proprinter control codes can be used and the front panel enables most of the functions to be controlled manually. Two separate printer setups can be stored and called up with a couple of button pushes.

With excellent quality print, reasonable speed, four useful fonts and full colour printing, the Star LC-200 provides a powerful combination of features at an affordable price.

EXPENSIVE PRINTERS

PANASONIC KX-P2624 £495

This is a colossus of a machine – big, bulky and heavy – and that's why it's so suitable for heavy use.

The KX-P2624 is a wide carriage printer and it can use both fanfold and cut sheet paper. The tractor feed can be switched to either push or pull-feed the paper and both automatic paper loading and parking are catered for. But the print quality is not superb. Draft



```
♥♦♣♠!"#$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
\]^_`abcdefghijklmnop
```

print is clearly readable and produced at 114cps. NLQ is good enough for the occasional letter and prints at 50cps. There is a good range of seven NLQ fonts built-in (NLQ Courier is shown above) and the KX-P2624 also produces 'super' NLQ print using two passes, imitating a 48-pin printer at 23cps.

IBM Proprinter and Epson LQ emulations are provided and LCDs make manual operation easy.

What really sets the KX-P2624 apart is that it is so quiet. A number of clever design features have reduced the noise of this machine to a fraction of that from other printers. This is one feature that classrooms will appreciate as much as offices.

MIDRANGE PRINTERS

CITIZEN SWIFT 240 £339

This is the first third-party imitation of Epson's new ESC/P2 dot-matrix standard. It costs the same price as the LQ-570 and has a similar performance. Like the LQ-570, versatile paper handling is a forte of the Swift 240; it has a push or pull selectable tractor unit, automatic paper loading and paper parking.

Print quality is excellent. It is hard to believe graphics from this machine come from a dot-matrix printer. Draft print is clearly readable and fast at 138cps. NLQ print, in one of nine fonts (Courier shown above) is almost up to laser printer standards and also produced at a good rate of 55cps – about 45 seconds per page. Two of the NLQ styles can be scaled to print in a range of sizes.

♥♦♣♠!"#$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
\]^_`abcdefghijklmnop



The Swift 240 is compatible with IBM's Proprinter codes and NEC machines as well as Epson's ESC/P2, and its front panel controls also score well over the Epson. With an LCD display combined with a clever slide switch that alters both the function and labels for four push buttons, the Swift 240 is simple and natural to use.

This is a truly remarkable printer – excellent printing, reasonably fast, user friendly and bang up to date. As if that wasn't enough, a colour version (the 240C shown here) costs just £20 more.

IBM MODEL 2390 £339

IBM is striving to widen its printers' appeal and there's no reason why Acorn users should not buy a printer from our arch-rival.

The 2390 is a compact machine, but may seem rather strange to those used to conventional designs. Cut sheet paper is loaded automatically and fanfold paper can be push or pull-fed through the machine, or parked out of the way.



♥♦♣♠!"#$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
\]^_`abcdefghijklmnop

The 2390 prints in three modes, NLQ, draft and 'fast draft'. In practice the two draft modes are similar in speed and quality, but the 2390 can manage 124cps in draft and a healthy 49cps in NLQ mode.

The NLQ print is excellent, and available in six styles (Courier is shown above). Graphics images too are printed well with dense, even shading.

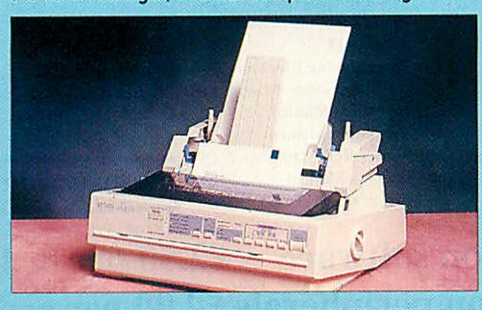
The 2390 is compatible with both IBM Proprinter and Epson LQ control codes, which should suit all users and most of the functions of the printer can be set manually by using the front panel menu system.

A machine with versatile paper handling, tough build and excellent print quality, the IBM 2390 is well worth a look.

EPSON LQ-570 £339

The LQ-570 is the cheapest of Epson's new 'ESC/P2' series, aimed at re-establishing the Epson mark.

All these printers share the same paper handling add-ons, so costs are kept low and several paper types can be loaded at once, allowing quick change-overs from churning out listings to a neat letter for the bank manager, without complex reloading.



!"£$%&'()*+,-./01
23456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[
\]^ `abcdefghijklmnop

Innovations associated with the 'new' technology of ESC/P2 mean the print quality from this machine is exceptional – draft is as good as some NLQ on some cheap machines, and NLQ (in nine fonts, two scalable) approaches laser printer standards. NLQ Courier is shown above.

Graphics are first rate and, at a pinch, the LQ-570 really could be used for DTP. The LQ-570 is fast too. At its fastest, it can produce about three pages per minute. Even in NLQ mode it can print a page in less than one minute. This printer is designed to last well under pretty heavy use and to be simple to use. Whether for home or business use, it's a bargain.

EXPENSIVE PRINTING

There may seem little point getting a dot-matrix printer costing more than about £400. You can buy an inkjet printer for this money, just as versatile and far better quality. Even a laser printer need not set you back more than £550.

Dot-matrix printers in this price range are sold not so much for their beautiful print, but for their longevity. Some of these more expensive machines – but not all – are built to take constant use day in, day out, printing endless streams of accounts data, receipts and so on.

It's not just business users who benefit from the extra money spent. Schools are prime targets too. There, longevity may mean a little less left in this year's budget but no call on it for many years to come.

COLOUR

Today many dot-matrix printers are either supplied ready to print in colour, or are easily and cheaply upgraded to achieve this (as with the Citizen Swift 240 shown opposite). It seems a tempting proposition but this is one area where dot-matrix printers have definitely lost their edge over other technologies.

All is well when printing straightforward text. Most machines can manage this in a choice of seven colours, produced by mixing print from a black, cyan, magenta and yellow striped ribbon. However, if a dot-matrix is used for colour graphics, the results rarely live up to expectations.

This is mostly because over-printing the same area of image with different colours inevitably produces smearing and mixing of colour onto the ribbon. Only if a brand new ribbon is used every time is there much hope of a good result – and this defeats the running cost advantage of dot-matrix technology.

It seems – for the moment at least – that colour printing is one area in which dot-matrix printers have lost the battle. But if you are after a functional printer that is cheap to run then there is good reason to stay with dot-matrix.



PROGRAMS

The section that is packed full of exclusive programs for you to use

Are there things that you just can't get to stay in your mind? For instance, what about all those irregular verbs in French? This month *BBC Acorn User* has the perfect application for you. Dave Acton and myself have put our heads together and come up with an application that will burn in all those little facts that seem to drop out of your memory. You'll find the resulting article on page 72, with the listings that make up the *Desklearn* application on the yellow pages.

Every few moments, *Desklearn* will pop up a multiple choice question. Click on the answer you think is right, and if you get it wrong you are shown the correct answer. Records of your performance are kept and *Desklearn* concentrates on the questions you are most unsure of. Watch your performance improve fast! You can create your own question files using *Edit* to download any subject under the sun into your head.

SPEEDY AND SIMPLE

Edit is fine for writing, but not for formatting and laying out text, for which you can use *Draw*, But *Draw*, like many other Risc OS applications uses graphics mode printing, which can take up to 20 minutes per page, and wear out your printer. *SimpleDTP*, our second major application this month, steps neatly between *Edit* and *Draw* and provides quick and simple frame-based text layout. Then you can print to your dot-matrix or daisy wheel printer using its fast draft mode.

It's easy to run off simple letters in five minutes, and you can use the built-in styles on your printer, like bold or italic.

Turn to page 69, and let *SimpleDTP* make a real impact on your letter writing.

*INFO begins this month with a program that is simple to use, yet which can turn you into an instant artist. Just turn to page 61 to see what I mean. We've tried it on several images, and turned each one from a plain boring picture into something that really looks good hanging on a wall.

Turning to art created by the computer, the strangely named *Gong1* and *Gong2* programs provide the type of electronic anarchy that *INFO is justly famous for.

For eight-bit *INFO readers we have a seasonal, and very impressive, firework display, with hundreds of multi-coloured dots flying around the screen. Speaking of dots, we have yet another wavy type program this month that bears a striking resemblance to a flag blowing in the wind.

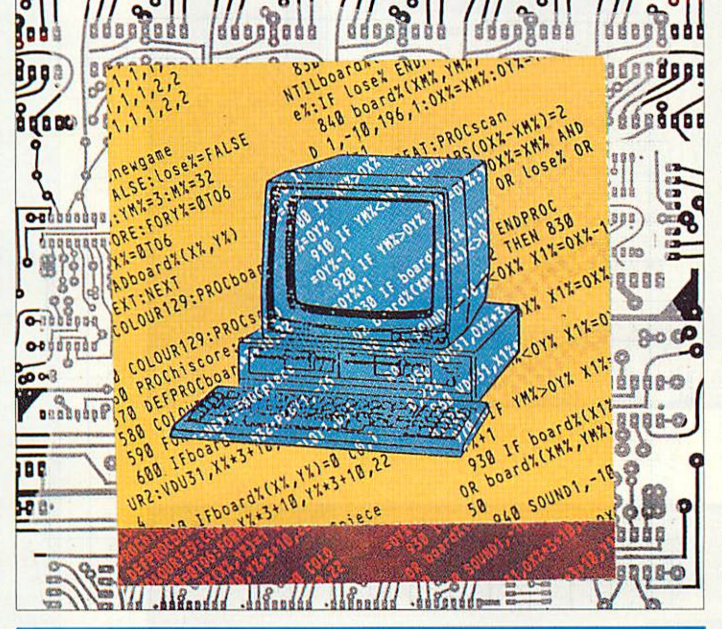
For those of you who want to make life more colourful, DA and DL tackle the tricky subject of colour on the Archimedes and how to get the hue that you want when you want.

We also have a little application called *Pointer*, which takes the chains off our little friend, and allows him to wrap around the desktop. It takes a while to get used to, but when you do you'll wonder how you lived without it.

With all the other regulars, like Line-by-line and Beginners' Corner, *INFO shows the variety possible in the Acorn world. Talking of variety, turn to page 58 for special details of a limited edition *INFO compilation disc.

Finally this month, for our regular army of programmers, we have DL's continuing Arm programming article, and then you'll find our yellow pages, containing all the listings for *INFO, *Desklearn* and Arm programming for you to type in, load up and use. If you think typing in programs is a bit of a chore, you're right. Turn to page 19 to find out how you can receive them every month, for free.

Paul James



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SCSIFS Network interlocking	
Set filing system to SCSIFS	

Configure Computer

:0 100MBExt Floptical 100MBInt Impress-1 :0 Apps

The SCSI configuration software

Connected SCSI Devices

Connected Devices

ID	Type	Capacity	Vendor	Product	Revision
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1	Direct access	42 Mbytes	SyQuest	SQ555	FGJ
2	Direct access	20 Mbytes	INSITE	I325VM	*F 0385
3	Direct access	101 Mbytes	RODIME	RO3000T	4.27
4	Read-only	Unknown	TOSHIBA	CD-ROM XM-3301TA	1651
5					
6	Scanner	Unknown	UMAX	UG80	V2.1
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We designed our interface and engineered our software, to be fully compliant with ANSI standard X3,131-1986. This is the definitive standard by which all SCSI hardware and software must be measured. So if you are thinking of buying a SCSI setup ask whether it meets the above criteria. You will probably find very few manufacturers who will give you a straight answer.

The interface card can be used on any RISC-OS based machine fitted with a standard expansion slot. This means that when you upgrade your machine your SCSI setup can go with you.

*Our installation software makes setting up your system a piece of cake. Instead of messing around with *commands once your interface card and device are connected you simply run a single piece of software, give a quick Ctrl-Reset and off you go. We also include one or two rather useful utilities which give detailed information about the devices attached to your system and the speed at which they operate, together with a very comprehensive manual.*

It all adds up to a complete system that has the future built into it. You can buy our interface and devices either directly from ourselves or ask for it by name from any good Acorn dealer.

Minimum system requirements

- ❑ *Acorn ARM based computer*
- ❑ *Acorn RISC OS 2 or 3*
- ❑ *1MB RAM*
- ❑ *Standard Acorn expansion slot*

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Our programming column, *INFO, has had a busy year. Now you can get all the best bits on a two-disc compilation

Since it began back in July 1991, *INFO has proved to be the home of the best in magazine listings. During its life, over 200 yellow page listings have been featured plus many more on the subscribers' discs. You can now get your hands on nearly a megabyte of this high-quality 32-bit software for a mere £7.95 all-inclusive.

Besides the huge range of graphics demos and simulations illustrated here, the two *Best of *INFO* discs contain oodles of advice on every aspect of Acorn machines, and many invaluable utilities.

Filing aids featured on the disc include *ABCdir* to keep track of your most recent files and *Biggest* to stop files eating up most of your hard disc.

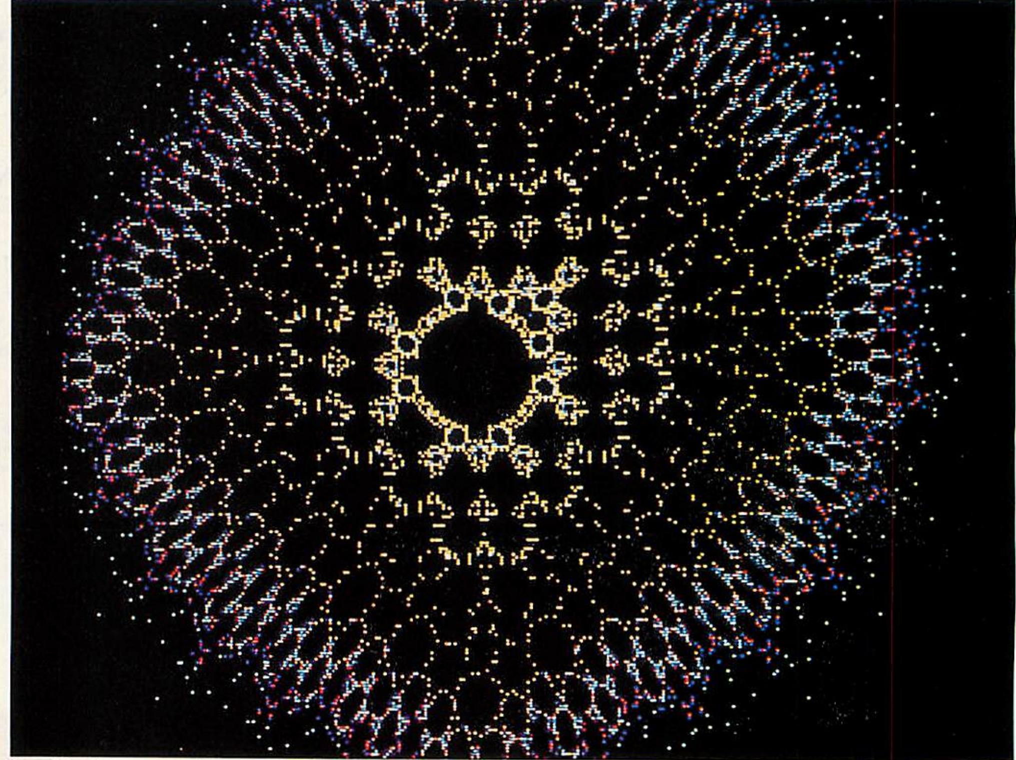
Desktop utilities also feature, like *TidyDesk* – a multi-purpose desktop aid, and *HourMaker* for designing and animating custom hourglasses.

Modules like *Accent* for easy insertion of foreign characters and *ListAid* for paper-saving multi-column listings are also included.

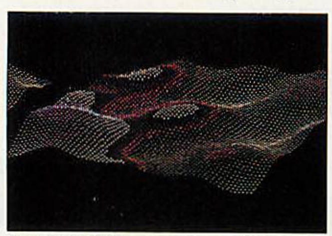
*HELP

Each program featured on the discs comes complete with a text file. In most cases this includes the text from the original article and, where useful, figures are also provided as *Draw* files. We hope you'll be able to use the ideas and techniques featured in your own programs.

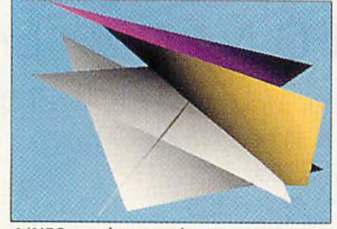
There's an index system to complete the collection, and an index of all *INFO items right from the start, so you can seek out the listing or snippet of advice you need.



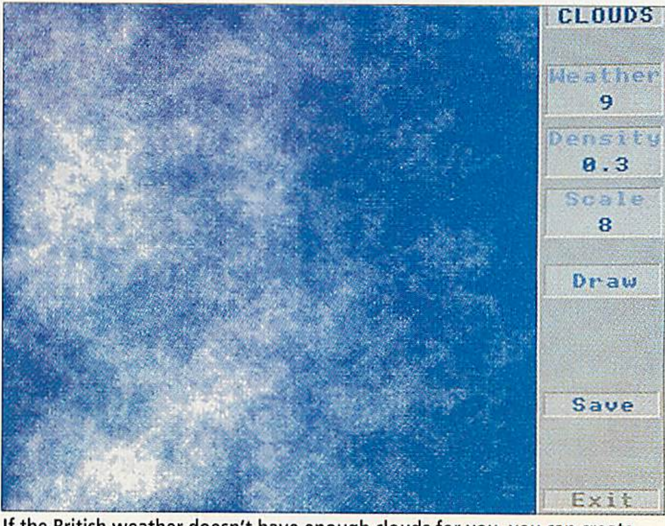
Graphics demos are what *INFO is famous for. Each one is an example of mathematics in action, but if you don't understand the formulas, just appreciate the results.



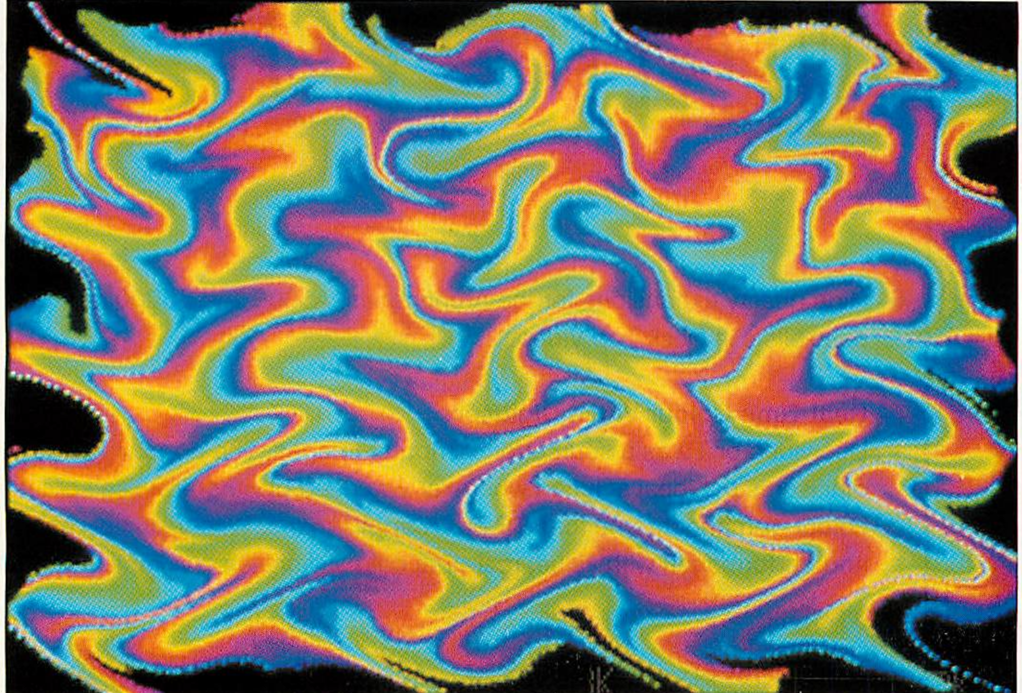
Real-time 3D waves: move them around with the mouse



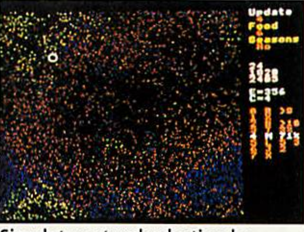
*INFO teaches you how to get more colour from the Arc



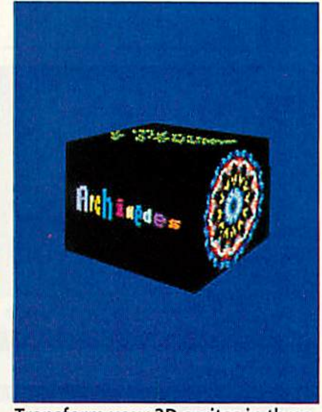
If the British weather doesn't have enough clouds for you, you can create your own, very realistic, on-screen equivalents



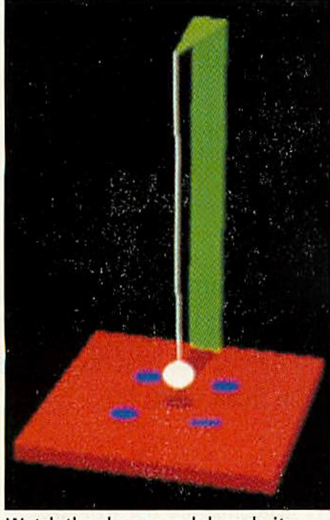
Fire32 is a simulation of a raging fire. Fully animated, it's an example of how to use colour cycling to achieve impressive results



Simulate natural selection by breeding software 'bugs'



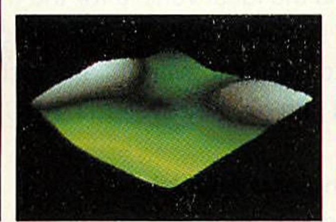
Transform your 2D sprites in three-space with Cube32



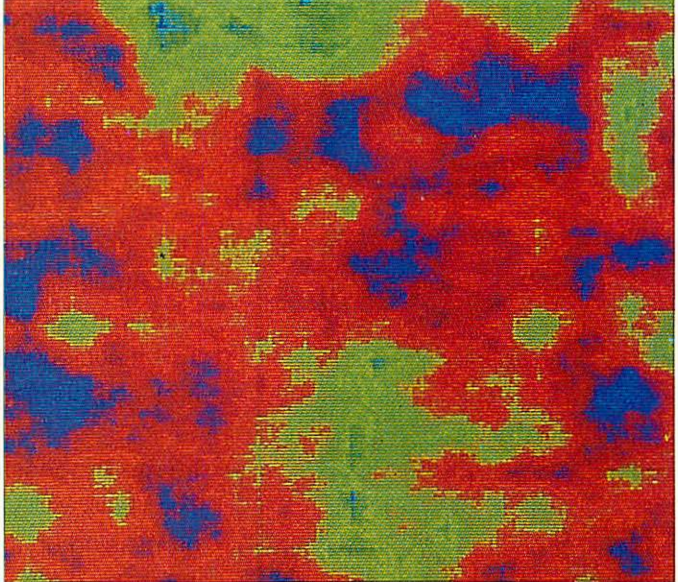
Watch the chaos pendulum do its own swing



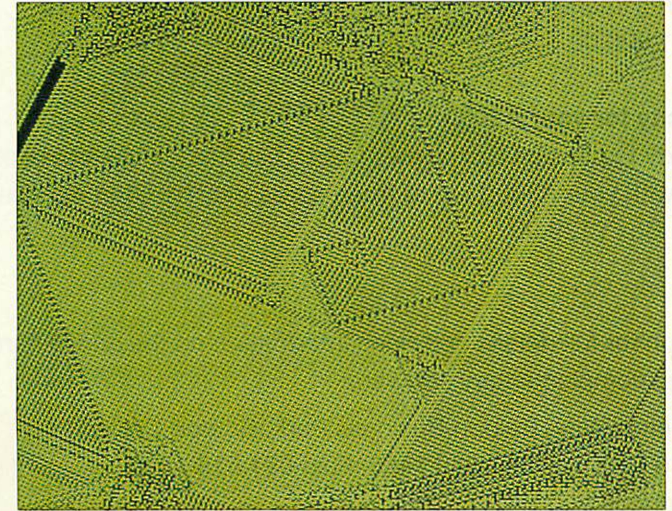
A Pythagorean tree grows to its full height



Glide over a 3D landscape, but watch out for high mountains



The speed and power of the Acorn 32-bit processor makes it possible to do many calculations per second, and makes it possible to write Plasma32



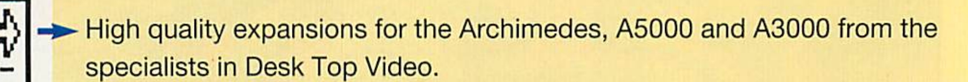
Enjoy the legacy of the great Alan Turing. Here, a 'Turmite', a two-dimensional Turing machine, draws out an enigmatic pattern

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ON THE MENU TODAY...

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Info



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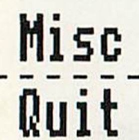
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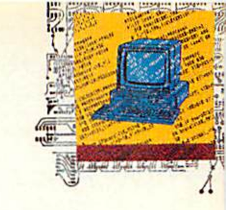
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WILD VISION



*INFO

Dave Lawrence and Dave Acton present their monthly mix of programs for all Acorn users

STAR PROGRAM

ABSTRACT ART

Program: Abstract
Description: Art program
Author: Adrian Skilling
Machine: 32-bit
Listing: 140 lines Basic

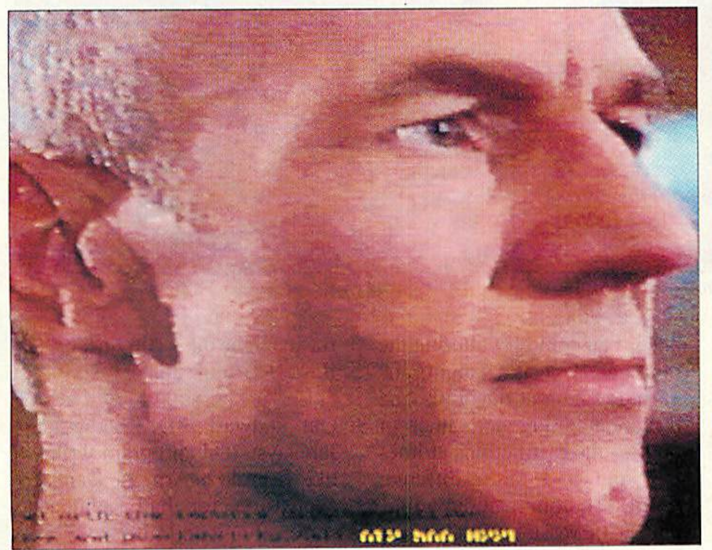
This is one of the simplest and best programs we've ever carried in *INFO; it will appeal to all 32-bit owners with an artistic streak.

Abstract takes a 256-colour sprite (typically a digitised picture) and allows you to 'convert' it into an impressionist painting. This is done with the mouse and a choice of brushes.

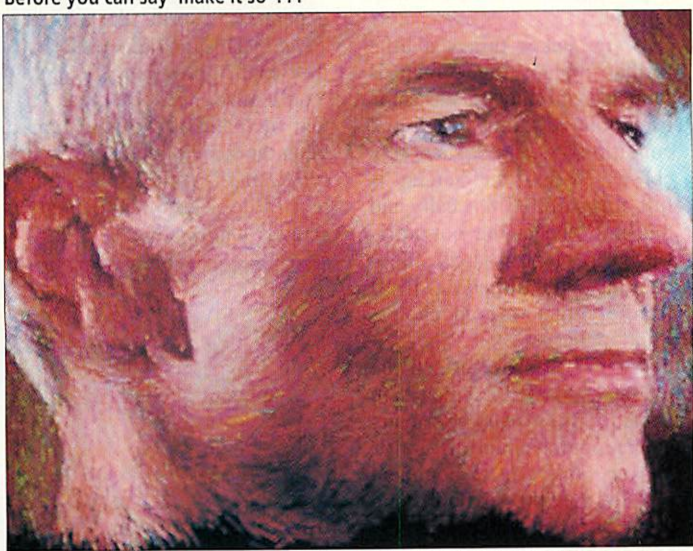
To try *Abstract*, run it and give it the name of a suitable sprite file. The program assumes that the file contains a single sprite which is the one to be edited. The file is then loaded and a blank, second sprite is created. You may toggle between original and new with the TAB key.

You choose brushes using the mouse's Menu button. Press it and the selected brush number (one to five) will be shown while you continue to hold the button down. The Select button is used for drawing and the Adjust button for deletion. The faster you move the mouse, the larger the brush strokes. So use quick motions for the background and small movements for detail.

You can save the finished sprite by pressing S and entering a suitable filename, or load another by pressing L. You can also 'undo' recent actions (at least since the last time you toggled screens or did something irreversible) with U.



Before you can say 'make it so' . . .



. . . Jean Luc becomes a victim of the Borgs' fiendish impressionism ray

It's surprising how effective the technique is, as the screen shots show. The In Detail box goes over the workings of *Abstract* more thoroughly, for the benefit of those who are new to Basic, or more experienced programmers who would like to enhance the program in some way. Of course, a desktop version of *Abstract* would be ideal – one window containing the original and another the new images. Is there anybody out there willing to come up with one?

IN DETAIL

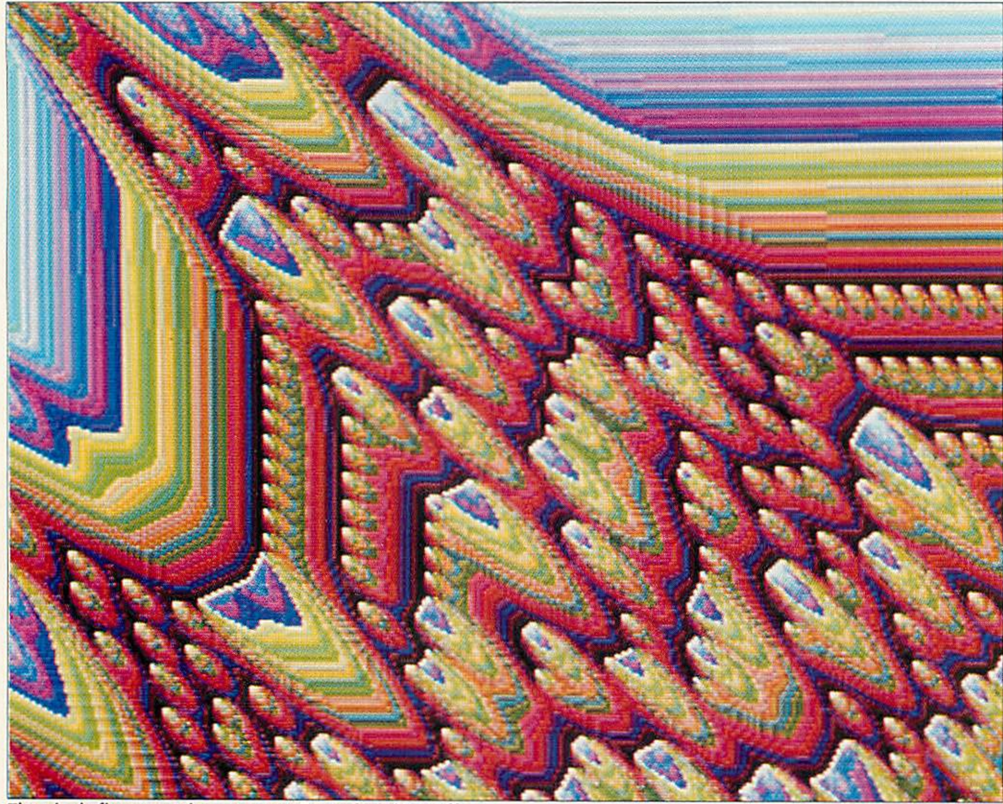
Sprite operations abound in *Abstract* – so much so that sprite_op% (=&2E) is used rather than OS_Sprite_Op, which is a good bit slower.

The original and new images are stored as sprites in a user sprite blockspr%. The new sprite is called abs. At first the original picture is displayed, but PROCscreenbank is called when TAB is pressed to toggle to the other screen.

When the original picture is displayed, the brush actions are painted directly onto sprite abs. This is done by redirecting VDU output to the sprite with OS_SpriteOp 60. However, when the user toggles to the new screen, the brush strokes appear directly on the screen. Sprite abs is left alone until the user toggles back (or does something else), in which case abs is grabbed from the screen to update it. This also permits an easy undo facility – abs just needs to be replotted.

Many variables can be altered within the program to usefully affect the results. These include: minsize and maxsize (the minimum and maximum brush sizes); density (the amount of paint/colour put onto the picture); rangemult (how large the overall range of the brush is); sizemult (how quickly the size of the constituents of the brush grow in relation to mouse speed). The current brushes are:

1 Directional lines
2 Filled circles
3 Filled squares
4 Random lines


The pixels fly across the screen as Gong does its stuff

GONG

Programs: Gong1, Gong2
Description: Graphic demos
Author: Stephen P Harris
Machine: 32-bit

The short machine-code routine in *Gong1* produces an interesting effect. A simple Basic function is used to plot a line of points on the left and top of the screen. Using these lines as the starting point, the routine fills the whole screen with an impressive psychedelic pattern.

Each pixel's colour is determined by taking the average of the colours of the pixels to the left and above it on the screen, and combining the result with a random element. It's possible to create a wide variety of different effects by making small changes to *Gong1*.

Firstly, the colour function FNcol can be altered so the start conditions are different. Some alternative settings for the starting parameters are:

```
DEF FNcol(c%)...
=c%
=c%+TIME
=RND
=TIME
=c%*TIME
=255*SIN(c%/1300)
=TIME/(c%+1)
```

Also, you could try altering the random effect by changing the 15 in the loop at line 740. And try commenting out either or both of the instructions at lines 820 and 830 for a different result. (To comment out a line, put a REM statement at the beginning and the line is then ignored).

Gong2 takes things a little further. Again the screen is plotted according to the same rules, but this time the initial conditions are randomly chosen. When the screen is full, it is scrolled vertically and the new line at the bottom is filled in appropriately. This continues indefinitely, as if we were flying along an endless 'random carpet'.

For even greater effect, the colours on the screen are cycled. As in *Gong1*, many changes can be made to *Gong2* to vary the effect: comment out 590 or 600 (or both), and try a different value after the LSR # at line 610.

PENWRITE

Program: Pen32, MakePen, Pen8
Description: Graphic demo
Author: Jan Vibe
Machine: Pen32 – 32-bit; Pen8 – all
Listings: 32-bit – 290, 40 lines Basic; eight-bit – 100 lines Basic +110 lines data

Our stalwart *INFO regular Jan says: 'This program writes like a broken Arm (a Danish expression for bad penmanship).' Run it and see.

Set-up routine *MakePen* generates a sprite file called *Pencil*. This is then used by the main program, *Pen32*. You'll also need to create a text file called *Text* which can be in the same directory. When run, *Pen32* will display this text file in convincingly scrawly handwriting.

The letters are produced using the data at the end of the listing. Each valid character is stored in a DATA statement, followed by the number of graphics commands needed to produce it.

Two commands are used: move (0) and draw (1). Each part of the letter is defined as a command followed by x and y offsets. Any invalid characters are replaced by spaces and only upper-case letters are used (lower-case ones are converted).

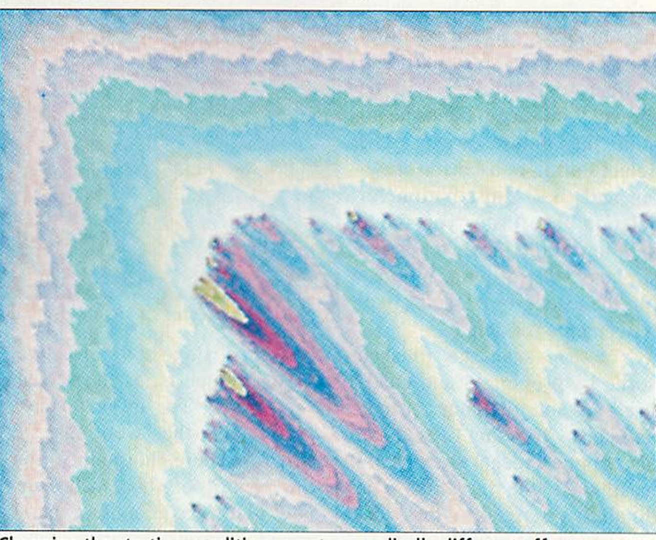
Eight-bit users have their own program. It doesn't have a pencil, but the resultant scrawl is just as bad. You'll need to enter *Pen8* and then type on the end all the DATA statements from *Pen32* – the statements are the same for both programs.

POINTER

Programs: !Pointer (!Runimage, MakeSpr)
Description: Desktop utility
Author: Graham Kendall
Machine: 32-bit
Listings: 100 and 40 lines Basic

This is one of those programs that may have you wondering what you did without it. It subtly changes the desktop environment by allowing the pointer to 'wrap-around'. That is, when the pointer reaches the left, right, top or bottom edge of the screen it reappears on the other side.

This may sound a bit strange and, indeed, it takes a little getting used too, but it does save a lot of effort if you can get the hang of it.


Changing the starting conditions creates a radically different effect

You'll need to create a directory called *Pointer*. Save *!RunImage* in this and run *MakeSpr* to create the sprite file. (Or design your own sprite file – you'll need one 34×17 sprite called *!Pointer*.) Finally enter and save the *!Run* file as follows:

```
IconSprites <Obey$Dir>.!Sprites¶
WimpSlot -min 16k -max 16k¶
Run <Obey$Dir>.!RunImage¶
```

This should be an obey file – use *Edit* to create it and press RETURN only when you see a '¶' character.

To use the application, simply double-click on it. A short menu allows you to toggle the wrap-around on and off. It works in all desktop modes.

The operation of the program is very straightforward. It simply monitors the mouse position and, seeing it reach an edge, moves it to the other side if wraparound is enabled.

SEASONAL STUFF

Program: FireWks
Description: Graphic demo
Author: Richard Talbot-Watkins
Machine: Eight-bit
Listings: 300 lines code/Basic

It's been quite a while now since we've actually managed to print a fireworks program at the right time of the year. So, here's a contribution from *BAU* regular Richard Talbot-Watkins.

A continual stream of rockets is fired from the bottom of the screen to explode later in glorious technicolor. Although the effect is quite impressive, the program works on a very simple principle.

An array of 160 dots is created (this figure can be increased to 256 by altering the variable num), each of which has five variables associated with it: its x and y coordinates, its x and y velocity vectors, and its colour.

The co-ordinates and vectors are actually stored to 16-bit accuracy, using two tables for each, the top eight bits being the actual value used, and the bottom eight bits being a fractional value which is 'thrown away' but used to allow movement by less than a pixel.

The program has two stages: the 'shooting' stage and the 'exploding' stage – both work in an almost identical way.

The colour of each dot is set to zero, meaning it is not yet active. Also, a few variables are set up containing the co-ordinates of the head of the rocket and its velocity vectors – these are called cx, cy, cvx and cvy, and are set up from Basic so that the rocket starts off positioned somewhere at the bottom of the screen. Next, the array of dots is scanned, and depending on the colour of each one, one of two things can happen.

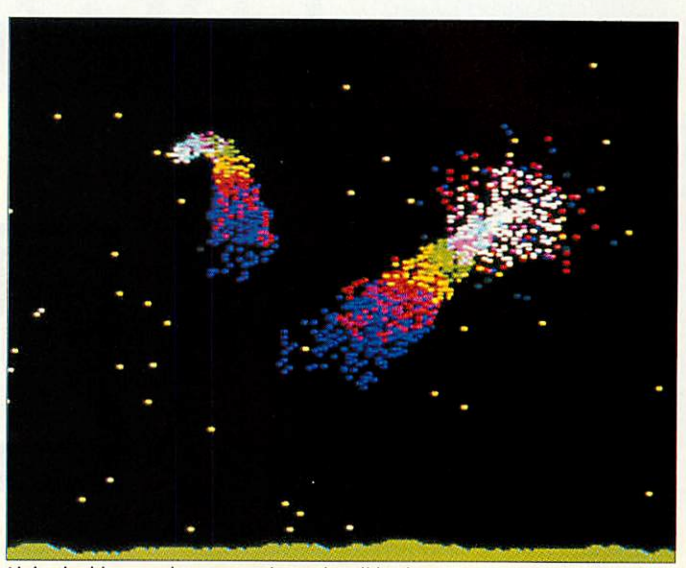
If a dot's colour is zero, meaning it is inactive, the coordinates are set to those of the head of the rocket, and random velocity vectors are assigned. During the explosion stage, these vectors can point in any direction to literally blast the sparks outwards. During the shooting stage, the values chosen are more refined, so the sparks drop from the sky.

Finally, the colour is set to white, and thus a new dot is created – six dots can be created each time the array is scanned.

If a dot's colour is higher than zero (active), it is moved in the direction of its velocity vectors, and a constant is added to the y velocity vector to simulate gravity's influence.

Every so often, the dot's colour is faded to give the effect of each 'spark' dying out. Once it reaches zero, it is once again deemed inactive, and its position in the array is then free for another dot to be created.

Once all 160 stars have been scanned, the head of the rocket is moved according to its velocity vectors, and the whole thing starts over again. The explosion phase is triggered any time after the rocket has reached its maximum height and is plummeting towards Earth again.



Light the blue touch paper and stand well back . . .

FLAG

Program: Flag
Description: Graphic demo
Author: Morgan Henry
Machine: 32-bit
Listing: 70 lines Basic

A short and neat little demo, this, for all 32-bit owners. A dotty flag is displayed and rippled according to some fiendish trigonometrical function. The result is very pleasing for such a small program.

NATURAL RESOURCES

Program: Register
Description: Risc OS 3 Utility
Author: DL
Machine: 32-bit only
Requirements: Risc OS 3
Listing: 130 lines Basic

The Risc OS 3 operating system available now for all 32-bit machines has many enhancements over Risc OS 2.

One such feature is the resource filing system that contains *Draw*, *Paint* and *Edit* and so on, a selection of fonts and 'resource files' for many of the operating system's modules. These generally contain help text, messages, errors and menu structures.

This filing system is called ResourceFS and is read-only. It is, however, entirely possible to add your own data, files and applications to the filing system. In this way you could, for example, store a copy of *Impression* that appears when you click on the Apps icon on the icon bar.

To put files into ResourceFS, they need to first be stored in a module that is then loaded into the RMA in the usual manner. One SWI call is needed to tell ResourceFS about the files when it initialises and another needed to make it forget about them when the module is removed. Each file within the module must be prefixed with a short 'header' that contains information about the file, with a final ALIGN after the program data:

Offset	Value
0	offset to next
4	load address
8	exec address
12	file length
16	file attributes
20 . . .	filename
	0-terminator
ALIGN	length+4
(. . . program data . . .)	
ALIGN	

HINTS AND TIPS

● Have you ever spent ages typing in a fiendishly complicated program, only to run it without saving it and end up losing all your work? This is obviously very frustrating, but there is a very simple way of avoiding the problem. At the first 'real' line of your program (after any REMs or whatever) include the following line:

```
OSCLI"Save Safe! "+
STR$~PAGE+" "+STR$~TOP
```

This will automatically save your program as Safe! whenever it is run. On 32-bit machines you can be a little more elegant:

```
SYS "OS_File",10,
"Safe!",&FFB,,PAGE,TOP
```

This has the same effect, but has the added bonus of setting the file type to Basic.

● The tilde sign in a PRINT statement means print the following number in hex. Did you know that if you miss out the commas, you only need to include one tilde after the print? The following have exactly the same effect:

```
PRINT ~A,~B,~C
PRINT ~A ~B ~C
PRINT ~A B C
```

An offset of 0 marks the end of the list of files. To put the files into ResourceFS, one call:

SWI"ResourceFS_RegisterFiles"

with R0 pointing to the first file is all that is needed. Similarly to remove the files from the filing system you need:

ResourceFS_DeregisterFile

The program *Register* does all this for you, though. On running the program you will be asked for a file (or indeed, a directory or application) to register and also for where it should be stored. If you want to put it in the root directory, you simply press RETURN. If you want it in Apps, type Apps and so on.

You do not need to create a directory structure as such. All sub-directories are implied by the full pathname of your file. If you register a file called *demo* in a directory called Apps.Mine.Demos the directories Mine and Demos will appear in the structure of ResourceFS.

You can enter as many files to *Register* as you like limited only by memory size. Increasing the 'Next' slot on the task manager before running the program will give you more memory for this. Once you have finished, simply press RETURN on response to the prompt and a module called *RFSmod* will be saved in the current directory. If you double-click on this to load it, your files will appear in the resource filing system.

As it stands the program always assembles a module called *ResourceFiles*. If you require a number of ResourceFS modules, you'll have to alter the names in lines 790 and 830, otherwise loading a new module will kill the old version and remove all its files from ResourceFS.

You might like to alter the program to prompt for a suitable name or, maybe, simply construct a name from the files entered by the user. If you type *MODULES, you'll see there are modules called *!Draw*, *!Paint* and so on. These contain all the associated files for these applications and *RMKilling them will remove all trace of them.

BEGINNERS' BIT

PROCEDURES AND FUNCTIONS – Part 2

Last month we looked at procedures and functions and how they can make a program more structured and therefore more readable. This month, we look at the enhancements Basic 5 offers 32-bit users in relation to procedures.

The most notable difference is that of RETURN parameters. You'll recall that functions return a single parameter (which may be a string or number or whatever) whereas procedures only take parameters and don't return any. When the Arc came along, this changed. You can prefix any parameter within a DEF PROC statement with RETURN. This indicates that not only does the parameter take the value given, but when the procedure comes to an end with ENDPROC the value is returned back into the original variable. Here is a short example:

```
a%=1
PROCadd1(a%)
PRINT a%
END
DEF PROCadd1(RETURN n%)
n%=n%+1
ENDPROC
```

The value of a% is passed to the procedure PROCadd1. This copies the value of a% into n%. Then n% has 1 added to it, making its value 2. However, because n% is a RETURN parameter, its final value of 2 is copied back into a% when the procedure is finished. So a% ends up as 2.

A more useful example is given in the program ProcDem. This provides a procedure called PROCanalyse, which takes a string and separates out all the separate words within it (quite a useful procedure really, and one which relies on RETURN parameters). PROCanalyse takes a total of four parameters:

orig$: This is the string to be analysed. It is returned, minus any words that have been separated off.

par$(): This is an array in which to put the separated words. It is a RETURN parameter and so any values put into par$() will be copied back into a$() when the ENDPROC is reached. For this reason, no dimensions are given for par$() and it does not need to be included in a DIM statement. It is assumed par$() has the same dimensions as a$().

max%: This is the maximum number of words to be separated. This must be included in case the array a$() (and hence par$()) overflows.

no%: This is the number of words separated. It is a RETURN parameter, so the value is copied back into the variable n% when the ENDPROC is reached.

There are really three classes of variable here:

- Those passed to a procedure but not returned.
- Those just returned from a procedure.
- Those passed to a procedure and returned.

As you may have noticed, max% is clearly of type 1. A type 2 variable is no%. The value of no% is copied back into n% when PROCanalyse is finished. However, nominally, the value of n% is copied into no% when the procedure begins. Since n% is not defined until the procedure is called, this value is taken to be 0. In any case, we are not concerned with the initial value of no% – we explicitly set it to 0 and then return it at the end. A type 3 variable is orig$. We pass this as the string to be analysed, and any excess words are returned in it.

COLOUR CHANGER

Programs: ColDemo1-4
Description: Graphic demos/ utilities
Author: Bryan Creer
Machine: 32-bit
Listings: Each 30-40 lines

The 256-colour modes are particularly popular with *INFO contributors. I suppose it's largely because they provide one byte per pixel which makes for short and speedy demos. One thing that is seldom attempted, however, is the changing of the default 256-colour palette.

Bryan Creer has supplied us with some short and pretty demonstrations to show exactly how it is done. First, though, a little background on this far-from-obvious subject could prove useful . . .

Sixteen-colour modes, like good old mode 12, are just that – you have a choice of 16 colours and you can set them to any 16 shades you like with:

COLOUR <0-15>,r,g,b

. . . where r, g and b are the red green and blue components and are values in the range &00 to &FF. Not surprisingly, the hardware provides 16 palette registers – one for each logical colour, and these can be set (using the COLOUR command or VDU 19) to 16 completely definable hues.

With only 16 hardware registers to use though, it is clearly impossible to define all 256 colours in mode 13, say. A compromise solution has to be found and figure one shows how it is done.

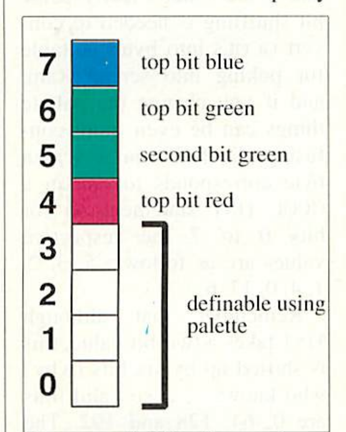


Figure one: in 256-colour modes you can only control four bits

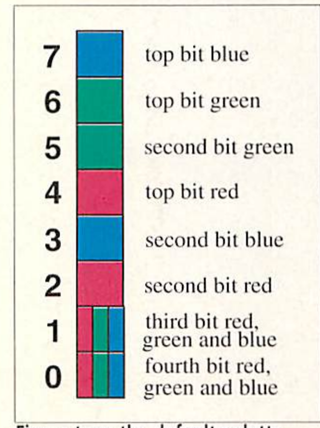


Figure two: the default palette settings for 256 colour modes

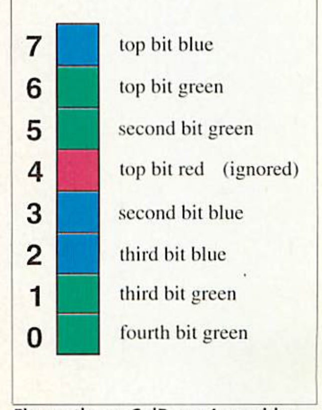


Figure three: ColDemo1 provides 128 blue/green combinations

As you can see, for any given colour c in a 256-colour mode, the top four bits (c AND &F0) are sent directly to the display hardware. These comprise the top bits each of red, green and blue and also the second bit of green. Thus, colour 128 always has top bit blue set – irrespective of how you alter the palette. It's as if you were to issue the command:

```
COLOUR 128,&XX,&XX,&8X
```

. . . if such were possible. Only the bottom four bits are definable. This has two implications. First, you can partially define any individual colour – though you can never remove the top blue bit from colour 128 and so on.

Second, you can only alter colours in blocks of 16. Any colour you change will affect 15 others. In fact, figure one shows that to alter colour 0 will change the physical colour of logical colours 0, 16, 32, 48 and so on. Change 1 and you change 1, 17, 33, 49 etc.

The default palette is shown in figure two. The colours are set up so bits two and three represent the second bits of red and blue. Combined with the top bits, this provides two bits each for red, green and blue.

Ideally, we would like three more bits to share between the three components, but there are only two, so they are set so they represent red, green *and* blue. This means that very dark shades of red, blue and green are in fact approximated to grey, but it does mean that there is a continuous scale of 16 greys from black to white available and this is important for fonts and the like.

With this in mind, it's a wonder why anybody would dare to change the palette at all. However, useful changes can be made and *ColDemo1* is an example.

Instead of sharing the bottom four bits between all three component colours, they are used exclusively for blue and green. This provides a total of four bits green (16 levels), three bits blue (8 levels) and a single bit red, which we can't avoid in any case as it's in the top half.

If we ignore any colours with this red bit set (and *ColDemo1* does) we have 256/2=128 colours to play with. Figure three shows how this works. All of this makes sense, since for each of the 16 green shades, we have eight blue ones and 16*8=128. All the blue/green combinations are shown on the screen.

At this point, a further awkward point should be noted – that of GCOL and TINT. The bits and bobs above refer to screen bytes. That is, figures three and four describe the colours of bytes poked directly onto the screen.

If you are being legal and using DRAW, PLOT and the like, you will need to select your colour with the GCOL instruction, and the values passed to GCOL are not the same. GCOL is a command that dates back to the days of the Beeb and, because the top bit has historically been used to select the background colour, GCOL is no use when specifying colours from a range of 256. Therefore, only six bits are used, the remaining two being provided with the TINT suffix, viz:

```
GCOL 42 TINT 192
```

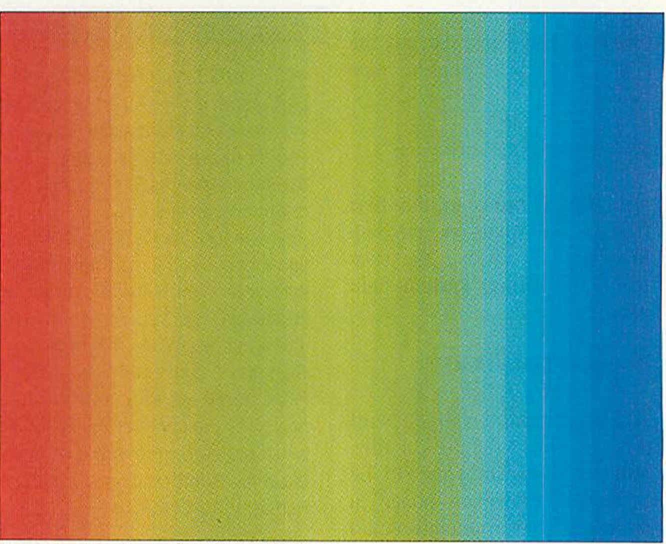
. . . and the like. To make things user-friendly (in fact, it's just to complicate matters) GCOL in 256-colour modes is set up to refer to the default palette (take a look at figure two again).

The bits provided in the GCOL part are the top two bits each of red, green and blue. The bottom two bits of them (remember, the bottom two bits are shared between red, green *and* blue) are added with TINT. Thus, if you just do a GCOL without a TINT, you will be specifying the main part of the colour – TINT is used for subtle differences.

Of the GCOL part, bits 0 and 1 are red, 2 and 3 are green, 4 and 5 are blue. Clearly some bit shuffling is needed to convert GCOLs into bytes suitable for poking into screen Ram, and if you change the palette things can be even more confusing. Each bit in a screen byte corresponds to one in a GCOL TINT statement so for bits 0 to 7 the respective values are as follows: 5, 3, 2, 1, 4, 0, 17, 6.

Remember that although TINT takes a two-bit value, this is shifted up by six bits (why? who knows . . .) so valid tints are 0, 64, 128 and 192. The *ColourTrans* module provides calls to do the conversion values shown above but you may need to look at these to check the table to follow Bryan's demos.

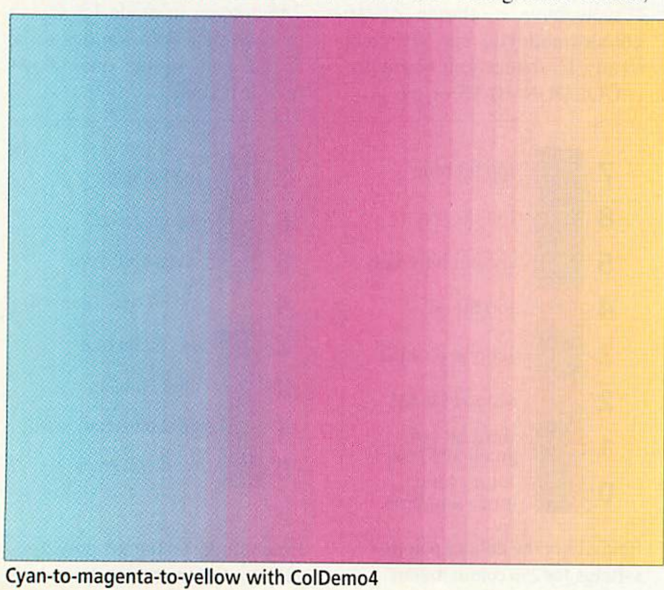
Having convinced yourself as to which bits go where, try *ColDemo2*. This provides 128 combinations of red and green. The single blue bit is ignored as the red bit was before.


Greens and reds can be done with ColDemo2

ColDemo3 is more complicated. It creates a continuous scale from red to green to blue. In order to achieve this, the palette is redefined in two lots of eight. Eight colours are set in varying amounts of red. With the top red bit, this provides 16 shades.

The green component is also varied, but the opposite way, so a scale starting with pure red and ending with pure green can be produced. The other eight colours form a scale from green to blue.

Finally *ColDemo4* provides another continuous scale – this time from cyan to magenta to yellow. The principle is the same as *ColDemo3*.


Cyan-to-magenta-to-yellow with ColDemo4

*QUIT

Listings, applications, hints, tips, requests – whatever you like, really – are always most welcome.

All but the shortest listings should be on disc together with a description. A stamped, self-addressed envelope will ensure the return of your disc. If you are a young reader please let us know your age.

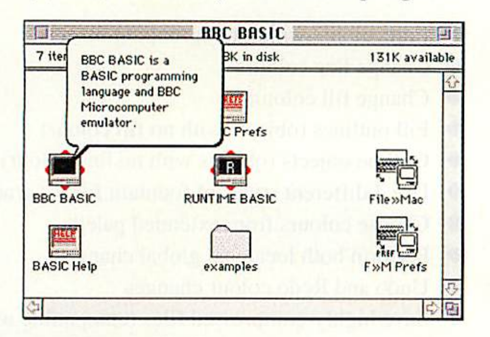
Send your submissions to: *INFO, BBC Acorn User, Redwood Publishing, 101 Bayham Street, London NW1 0AG.

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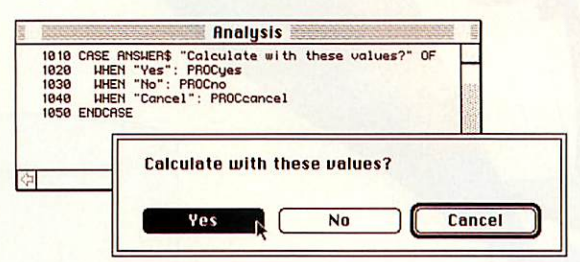


Balloon help provides instant information about the menus and dialogue-box options.

Save Graphics option saves the BBC BASIC graphics screen as a PICT file that can be loaded into other programs.

Runtime BASIC utility converts your BASIC programs into stand-alone double-clickable Macintosh applications.

Macintosh-style interactive editor provides a scrolling view of program listings with convenient cursor or mouse editing. You can work with any font available on your system and you can display keywords highlighted in bold for easy reference.



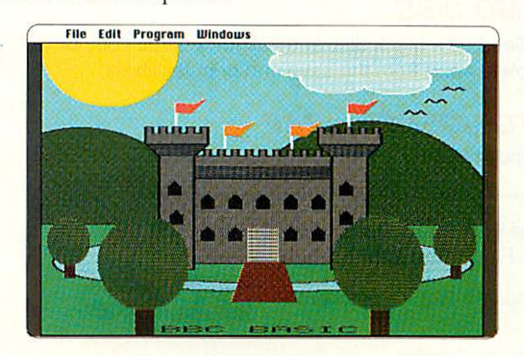
Macintosh Toolbox interface allows you to define your own menus, dialogue boxes, and scrolling lists using convenient BASIC keywords, and use the standard file dialogues for opening and saving data files.

Dynamic tracing and debugging lets you run or step through a program, highlighting each statement as it is executed, and you can display the values of any variables or expressions.

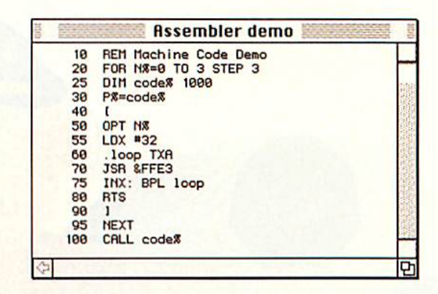
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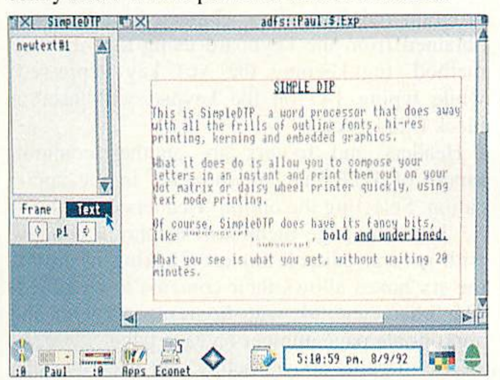
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SIMPLY READ

Fast printing of combined text and graphics on a dot-matrix machine isn't easy, but Barry Wickett's done it

'Oh, that's good, you'll be able to do my news-sheet on that', said a friend to whom I was busy showing off my new Archimedes. I had obviously impressed him a little too much. He got his news-sheet but, in the absence of a laser printer, it had to be entirely printed using my humble Epson LX-400 dot-matrix machine. Naturally, using the Risc OS printer drivers was out of the question since, however beautiful their output, they are far too slow for the job. Instead, I employed a simple word processor that used the fonts of the printer. This method was by far quicker, but I was a little disappointed with the results. It didn't really show off the power of the Archimedes.



A wide range of styles can be displayed and printed

So I set out with the old reference manual and my collection of *BAUs* under my arm and wrote *SimpleDTP*. I was pleased with the results of my labour – it produces a typical page in under 40 seconds, compared to over five minutes using the printer driver. It is also the first DTP program I have seen that can be used on a daisy-wheel printer.

The program started out very simple, but it wasn't long before the main features of a regular DTP package were implemented. It uses the Epson's control codes. These printer codes support most of the DTP-type effects – bold, superscript, subscript, underlining and so on. The IBM graphic characters were also used for the border and bullet characters. But as the program got more impressive, so did its size, nearly 90K – too long for a printed listing – so it is only included on the monthly disk.

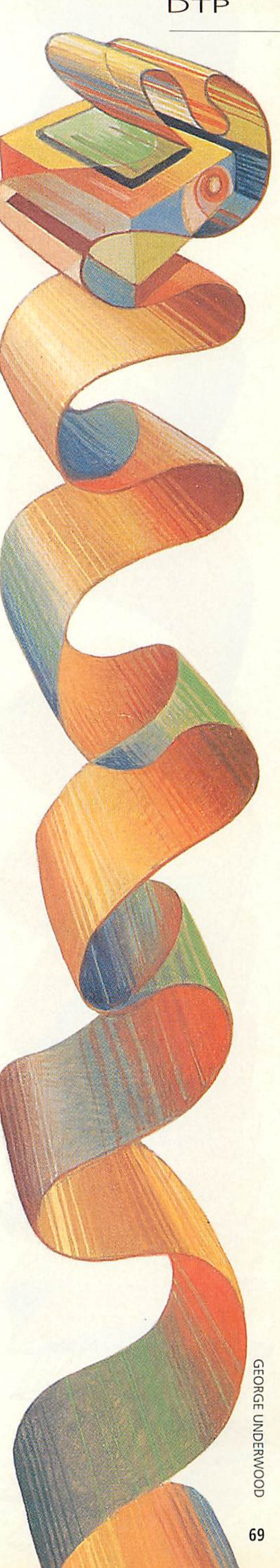
USING THE PROGRAM

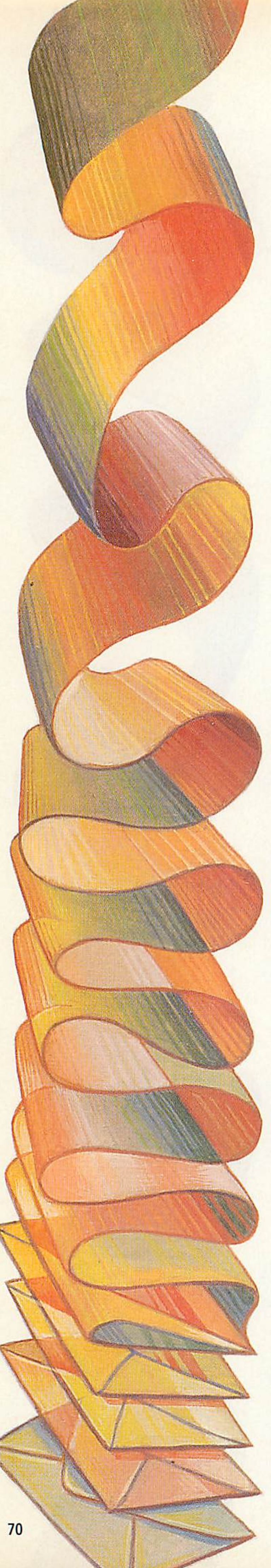
Install the program from the icon bar in the normal way. The program, like most DTP programs, is frame-orientated. To create one, hold down Select while dragging to the right and down. The frame can now be edited by dragging one of the four corner tags, and can be moved in its entirety by dragging somewhere inside. To select a frame, click Select somewhere within its boundaries. The usual frame options are included in the frame menu, such as Cut & Paste. You will notice the key shortcuts on this menu for these operations.

Text can be added in two ways: The first is from text files that are dragged into the view window. If a text already exists with the same name then it is replaced by the new version, and will flow where the old one once flowed. The name of the text file is added to the list in the work window and assigned to any currently selected frame. To assign a text that is already loaded to a frame, select the frame and then select the text by clicking on its name. You can then make the text flow between frames by assigning the text to more than one frame.

STYLE CHANGES

When you prepare a text file you can include style change sequences that the program will translate when loaded. If the character '\' occurs in the text, the program will take the next two characters and translate it into a special control character. They are as follows. Paragraph styles: \lt -left, \rt -right, \ce -centred and \js -justified. The following will toggle the styles on or off so to make a 'Hello there' appear bold you would use '\bdHello there\bd'. They are \sp -superscript, \sb -subscript, \ul -underlined, \bd -bold and \nm -normal. The last removes any styles in


GEORGE UNDERWOOD



the current text. Click on the word 'Text' in the work window to switch to text mode (clicking on 'Frame' reverts back to frame mode). The pointer now turns into a caret when it is in the view window.

You can place the caret within any frame; if it doesn't contain any text then a new one is created. The editing caret appears in the view window and the text can be edited in the normal way, using the arrow keys to move around and so on.

While in text mode, parts of the text can be selected by dragging using Adjust over the text. This portion's style can then be changed by selecting one from the style menu (a sub-menu of the edit menu). But if the portion of text already has this style, it will be removed. Paragraph styles can be changed by placing the caret in a paragraph and selecting a style from the format menu. A quicker method of changing styles is to use the function keys – the Format and Style menus tell you which keys to use.

Double-width text is used by selecting a frame and adjusting the text width using the frame menu. The border menu can create borders: for example a dividing line can be made by creating a thin frame and adding a suitable border. Due to the nature of printing borders, any text contained within the frame will be indented by one character. The last option in the frame menu – Remove text – will simply de-assign the text from the current frame.

PRINTER POWER

Once the document is complete, you can print it using an Epson-compatible printer. Just click 'OK' in the print window. The number of copies and which pages are printed is entered. The program does not need a printer drivers, although it will print to the device that has been set (parallel, serial, network or whatever). All of the printer codes are set out at the end of the program, with plenty of REM statements to say what they do. You can alter these for daisy wheel or non-standard dot-matrix printers and you can also change the list of bullet characters.

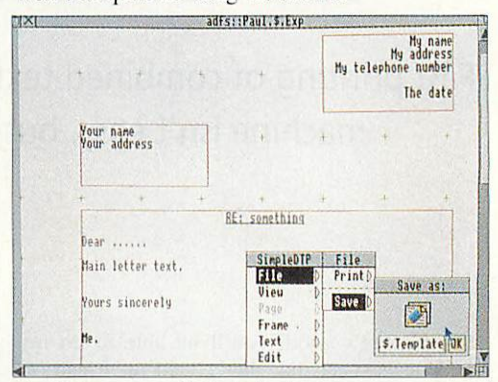
The program is designed so that it can be used for different output sizes. When creating a new document you can change its size using the icon-bar menu. This means that you can print using cut sheet paper or other paper that is not 80x64 characters in size. Whatever size you make the document, the program will automatically make sure that each line starts at the left of the paper and every page starts on a new sheet of paper (this is assuming that the printhead is set at the top left of the paper to start with).

BETTER LETTERS

I have found *SimpleDTP* most useful for laying out letters. Create a frame in the top right corner, enter your address in it by clicking inside it while in text mode. And then create a further two frames for the person's address and the letter. Save this, so that it will be ready for use every time you write a letter.

Write your letter in *Edit* or whatever, then drag the file into the view window with the 'letter template' loaded. Then you can enter the address and do any minor modifications to the letter, such as highlighting or changing the paragraph styles. A tip here is to start the letter with the person's address, then place the text in the address frame and then let it flow into the letter frame. So, if you want to record the letter, you can save just the text file.

It's possible to create quite complex documents using the program that are not only quick to print, but satisfying to the eye. The grid is quite useful for positioning columns and such like accurately. The grid crosses are 10 characters apart both vertically and horizontally, but the system fonts are slightly taller than those of a standard printer and so the finished product won't be quite as 'long' as shown.



Your letters can really look the business

Also, standard print is 10 characters per inch, so the grid squares are exactly an inch wide. I have found that a two-character gap between columns is about right. To get a vertical line to separate them, leave three spaces and then create a tall, thin frame in the middle with a vertical border.

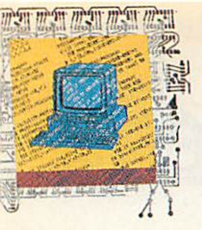
Bullet characters are useful for short lists, or to make titles stand out even more. There are at present three bullet characters: a black filled circle; a black circle outline; and a diamond; characters 143,144 and 147 respectively. The program redefines these characters and can be obtained from the keyboard using the ALT key method. (eg keeping the ALT key depressed, while typing 143 on the keypad will insert a black filled circle).

Headers and footers are another common aspect of DTP that are included in the application. Selecting the option 'Headers & Footers . . .' from the page menu will display a window with several editable boxes. Clicking in any of the six boxes allows their contents to be edited. The character '#' will be replaced with the appropriate page number on each page.

The margins above, below, left and right can be adjusted by clicking on the arrow icons. The headers and footers can be bold and/or double width. Adjust everything to your requirements and, when happy, click OK. These headers and footers will now be displayed on every page, unless you tell the program otherwise by turning them off using the page menu.

PAGES AND PAGES

It is possible to have up to 99 pages which can be inserted, added, deleted and even copied. The last option I have found particularly useful. Instead of having to copy individual frames from page to page you can copy the whole page and any text will flow automatically – making life simple for documents with similar pages.



LOOK AND LEARN

Absorb facts while you work with Dave Acton's multitasking teaching program

It's easy enough to add a few megabytes of Ram to your computer these days but what about the 'bytes' in your brain? Can your micro improve your capacity for information? *DeskLearn* is a multitasking application that aims to help you learn while you work.

The old parrot-style methods of learning employed in schools a century ago have, thankfully, gone out of favour. Common sense suggests that understanding is far superior to mere repetition when it comes to learning any subject.

Some facts are difficult to absorb though. Take the French verb *connaître* – to know. Is the first-person present tense *connais* or *conaîs*? Until you achieve some degree of fluency, grammar and spelling can only really be improved with practice. Whatever the subject, this usually boils down to regularly testing yourself (or getting someone else to test you) on your weak points.

Computers have a lot to offer most areas of education, but *DeskLearn* is simple in its aims; to quiz you regularly on your chosen subject and concentrate on your weak points.

In this area the computer has several things to offer:

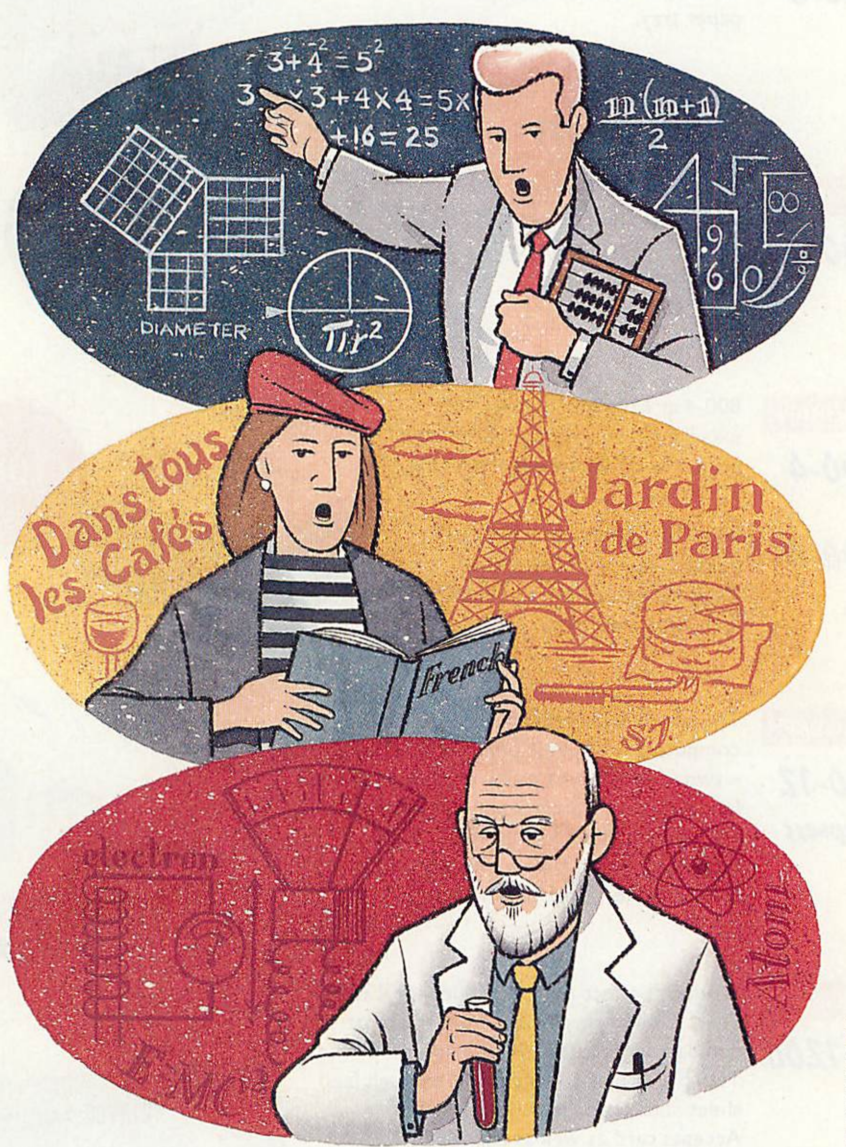
- It can test you, when there's no human assistance.
- It can record how well you do on a particular question or subject.
- It can spot which questions give you the most trouble, and ask them more frequently.

MEMORY RHYTHMS

Revision aids often advise that you should study for short periods – perhaps only 10 or 20 minutes each, rather than swotting for an hour or more. The reason is simple – we retain more information from the beginning and end of a session than the middle. More, shorter, study periods means more of those beginning and end phases during which we are 'better' learners.

Going over what you have learned is also vital. Strangely enough, you actually remember more from a study session 10 minutes after it's over than immediately afterwards. It seems the brain has a little sort out after you've fed it with facts. For this reason, spending some time going over material learned 10 minutes later will often help to embed it in the memory.

DeskLearn, by running constantly while you work, can repeatedly quiz you on the trickiest of facts at regular intervals. This too should help you remember facts you would otherwise forget. The program is a Risc OS application. There are three listings – *MakeDat*, *!RunImage* and *MakeQuest*. Eight-bit users have their own program, *Learn8* which is described in the box.



STEPHEN JEFFREY

First, Create directory *!DeskLearn* and in it save *!RunImage*. Then run *MakeDat* in the directory and this will create the templates, the sprites and all the rest.

Questions are stored as simple text files within *!DeskLearn.Subjects*. The box describes the question file format so you can create your own files. Create a *Subjects* directory inside *!DeskLearn* and in this, run *MakeQuest* which will create a sample question file called *Africa*.

There is another directory called *!DeskLearn.Data* which is a 'mirror' image of the Subjects directory. Each question file in text format you provide will ultimately have a corresponding data file in *!DeskLearn.Data* – created by the application and containing a record of how well you did. *DeskLearn* can also load a set

of questions more quickly using the data format rather than decoding your textual questions and answers each time.

Having set up your directory, double-click on it and the *DeskLearn* icon should appear on the icon bar. There are six Menu options:

Info: Current version number

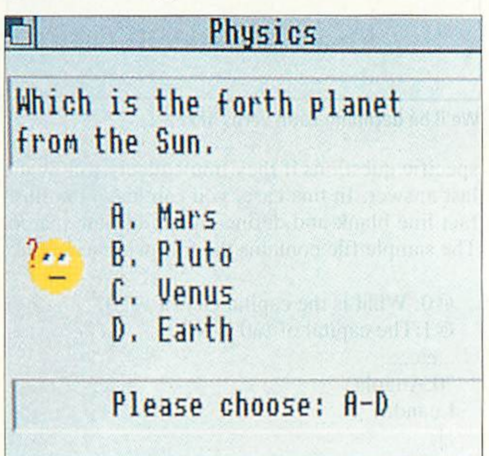
Subject: The subject tree. Each valid question file appears in this menu tree which mirrors the files and directories in *!DeskLearn.Subjects*. Click with Adjust or Select to include or exclude a particular topic. Any subject directories which are empty, and any invalid question files are 'greyed out' and unselectable. The computer chooses questions at random from any of the selected question files.

Interval: How long the application waits between questions. The times given are average ones and the actual time *DeskLearn* waits varies a little at random.

Stats: Used to switch the statistics window on and off. This window shows you how well you have done in the current session, on the current subject and on the current question. In each case the results of the last 32 questions are shown. A red block means you got it wrong, green means you were right.

Open dir: allows you to open the directories inside *DeskLearn*. Open the text directory to create a new subject or question file. You may also want to open the data directory. Deleting a data file will leave the original questions and answers intact but will erase your records. Should you re-order files with the text directory (for example, rename French.Rg as French.Verbs.Rg) you will need to mirror this change in the data directory.

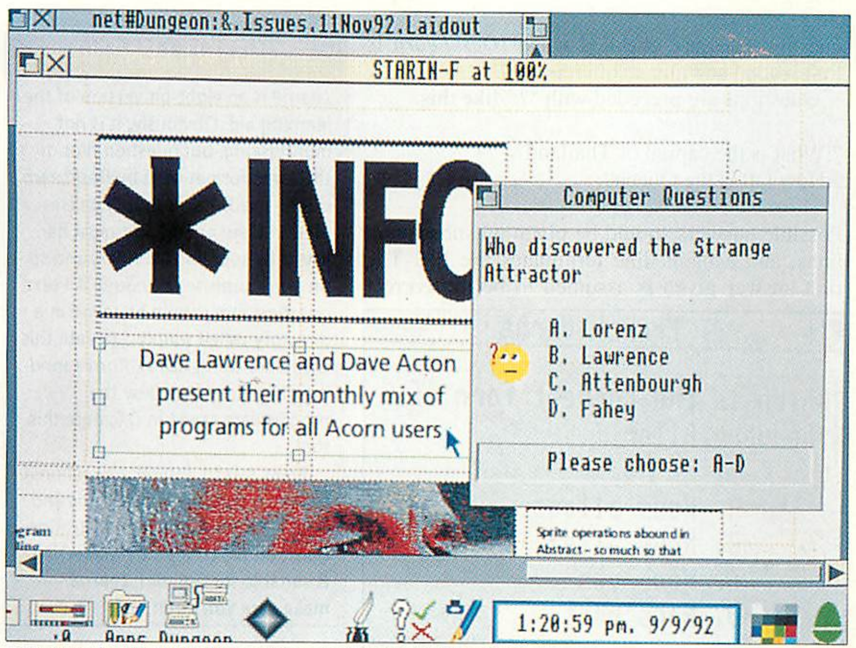
Quit: kills the application.



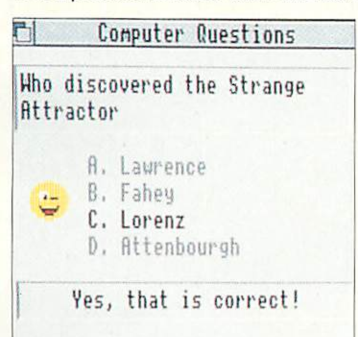
Astronomy: excellent. Spelling: could try harder . . .

When a question appears, you simply click on the appropriate answer. You will be told whether you're right or wrong, and the window will vanish.

If the currently loaded question file contains 'flash facts', which will appear at random at similar intervals to the questions. You can force a question or fact to appear by clicking on the *DeskLearn* icon with Select or Adjust respectively.



BAU's production editor takes time out to expand his mind



Education is its own reward

Because the record of how well you do on a subject/question is saved back when you quit or change subject, the *DeskLearn* application should really be somewhere permanent – like a hard disc. If not, you will need to re-insert the appropriate floppy from time to time if you use others in the meantime.

ENHANCEMENTS

DeskLearn has been kept necessarily short for publication, so there are several areas where it could be expanded:

Questions without multiple choices You would need an Enter box and some intelligent routines to see if the user typed the right answer.

Animation To appeal to younger learners. The subscriber's disc contains an example of this.

File weighting Currently subject files are chosen at random from those selected, so questions in shorter files are more likely to pop up.

Intelligent flashing Facts are flashed at random but those related to questions you've got wrong could be flashed more often.

Improved questioning algorithms For example, evaluating answers in terms of how long the user takes to reply to the question.

I would be glad to receive comments from readers on how *DeskLearn* might be expanded and how useful they find it.

QUESTION FILES

DeskLearn employs multiple-choice variety that are entered as simple text files in *!DeskLearn.Subjects.*

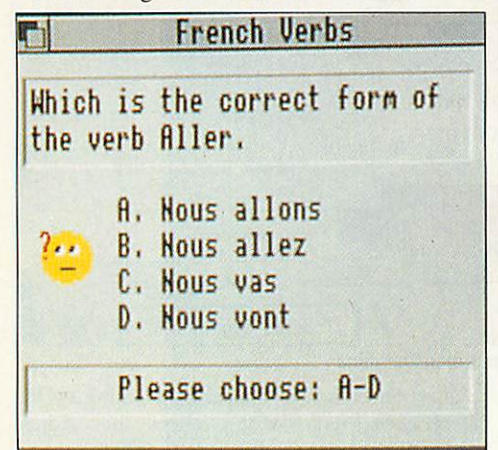
The directory structure within *Subjects* is mirrored in the subject menu tree. Therefore, you may use directories and sub-directories to organize your questions logically. For example, in *Subjects* you might have directories *French* and *German*. Within *French* there may be *Verbs* and *Vocab* and within *Verbs* you might create the question files *Regular* and *Irregular*. A similar structure could be used in *German*. All

question files are checked when *!DeskLearn* is first loaded and any errors reported.

Questions are preceded with '?:' like this:

?:What is the capital of Thailand?
?:How tall is the Queen?

Possible answers should be given on subsequent lines, and a blank line terminates the list. The first answer given is assumed to be the correct one. You can ask any number of answers up to four. For example:



Les irregular verbs sont facile

?:What is the capital of Thailand?
Bangkok
Seoul
Delhi
Paris

Many questions will take a similar format, so 'macros' are provided for this purpose. These are general questions with 'holes' in. Into these holes are placed the specific details of a question. Up to 10 macros may be defined and used in a file. These are declared with @n: (where n is 0-9) and used by placing the appropriate digit after the ? in a question line. You can do it like this:

@0:What is the capital of %*0?
...etc...
?0:France
Paris
London
Rome
?0:Sweden
Stockholm
Oslo
Bjorgsville

The %*0 means 'everything' so all text given after the ?x: is substituted into the macro in place of the %*0. You may use %0, %1 etc to substitute individual words.

If only one answer is given after a macro question, the program attempts to find another three 'decoys'. These will be taken from other questions that use the same macro and themselves have only one answer. So, for example:

@0:What is the capital of %*0?
?0:England
London
?0:France
Paris
?0:South Korea
Seoul
?0:Congo
Brazzaville

might produce this question on screen:

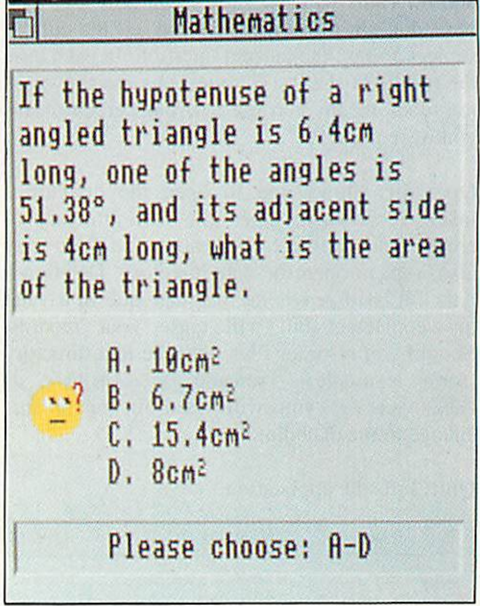
What is the capital of France?
A. Brazzaville
B. Paris
C. London
D. Seoul

Obviously answers are scrambled each time a question is displayed.

'Flash facts' can be included in a question file and these must be preceded with '!':

!:The capital of France is Paris

Like questions, a macro number may be included and flash facts may be associated with specific questions if they immediately follow the last answer. In this case, you can leave the flash fact line blank and define an appropriate macro. The sample file contains the following example:



We'll be declining Latin verbs next . . .

@0: What is the capital city of %*0?
@1:The capital of %0 is %1.
...etc...
?0:Angola
Luanda
!1:

In this case, the message 'The capital city of Angola is Luanda' may be flashed, since the %0 in macro 1 is filled with the text of the question and %1 with the correct answer. For certain types of question, this system should save a lot of typing.

Comments may be included in a question file preceded with #, and $: goes before the title to be used at the top of the question window.

EIGHT-BIT LEARNING

Learn8 is an eight-bit version of the learning aid. Obviously, it is not multitasking, but question files of the same format used by *DeskLearn* can be used. These should be created in *View* or *Edit*, but must be saved by spooling (so rulers and so on don't confuse the issue). All text question files should be saved in a directory called simply *S* (create this if you are using ADFS). Corresponding data files created by the program are saved in *D* (create this too).

Press A-D to answer a question, L to load a new set of questions and SHIFT-Q to exit. The demonstration question file created by *MakeQuest* is suitable for use with *Learn8* – make sure you put it in *S*.

ScanLight

PROFESSIONAL

A new version of the ScanLight Professional, offering improved software, a new, more compact scanner, higher resolutions and a greatly reduced price.

ScanLight Professional is our top of the range flatbed greyscale scanner. It offers up to 600 dpi, A4, 256 grey-level scanning (1200 dpi 16 grey-levels and monochrome) in a device that is not much larger than a sheet of A4. The ScanLight software provides all the facilities required for the most sophisticated image manipulation and enhancement. This scanner can be used for producing 'magazine quality' typeset greyscale pictures. The perfect partner for top end DTP.

The ScanLight range of scanners offers several unique advantages over alternatives. All image manipulation and enhancement can be performed directly on the original scanned image data. It does not need to make more copies of the image, and since 256 grey-level images can be very large indeed this can make the difference between being able to scan what you require and not.

Other ScanLight features include:

- **Continuous on screen dithering to produce the best possible screen image**
- **Simple brightness and contrast controls**
- **More advanced curve based grey-map control**
- **Instantaneous image rotation by any angle**
- **Dozens of image enhancement options such as sharpening**
- **Supports the new RISC OS 256 grey-level sprite format**
- **Scan any selected area of the image**
- **SCSI based scanner compatible with all Acorn compatible SCSI cards, known to work with Oak, Lingenuity, Morley and Acorn SCSI cards**

Toolbox
Sampling: 1x1=256 levels | none | 2x2 | 4x4 | 5x5 | 6x6 | 8x8
Enhance: Sharpen.Low
Current greymap
Output: Monochrome | 16 greys | 176 greys | 256 greys
Rotate 45 °
More... | Update | Cancel | OK

The main ScanLight control panel, offering various sample sizes, enhancement options, rotation control, and an editable grey-map curve in the centre.

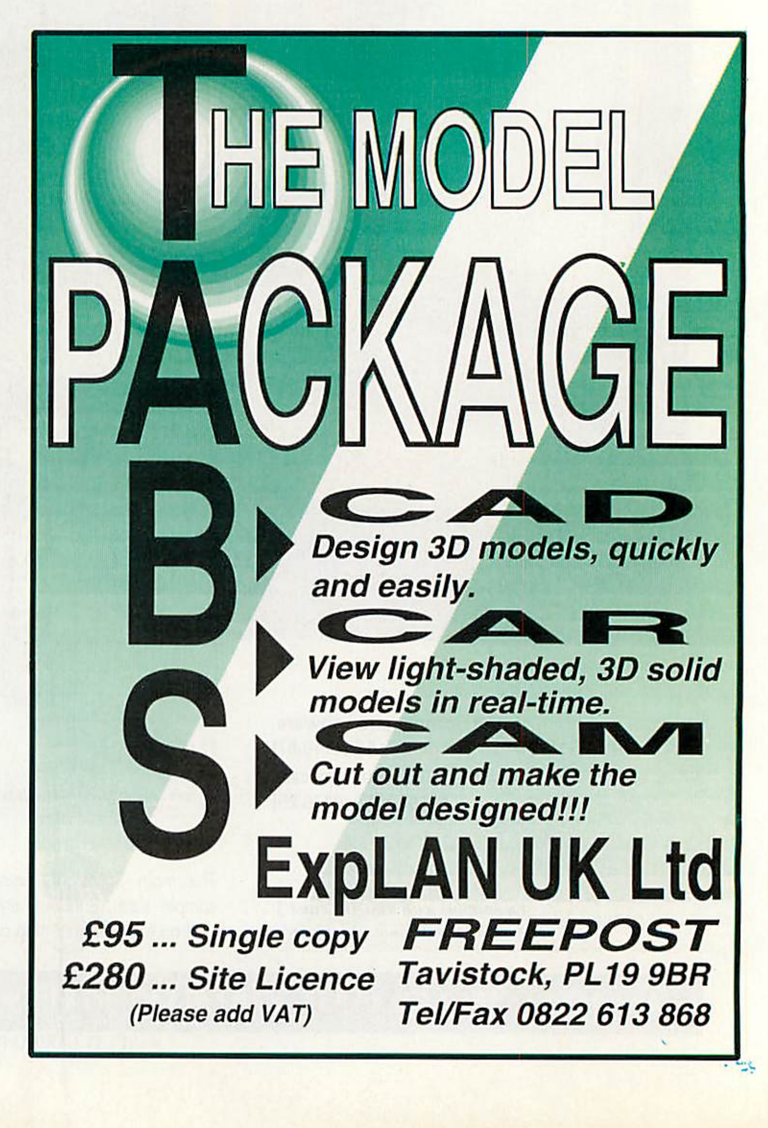
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Optional SCSI interface card
£150 +VAT (£176.25)

Compatible with RISC OS 2 and 3.
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PAUL SCHOFIELD

ASSEMBLY LINE

Dave Lawrence explains more about Arm programming

You should now be at a stage at which you can confidently access any part of memory using Arm code. In the last two months, I've dealt with . . .
Loading data from single locations:
LDR R0, total
How to get hold of single bytes:
LDRB R1, ascii
And how to access arrays of data:
LDR R0, [R1, R2, ASL #2]

With these under your belt, the next step is easy and involves two extra twiddles to LD and ST: auto-update and auto-increment. If you glance back at the second listing in last month's article (the one that added up a block of numbers), you should see that values were retrieved from memory using two registers; a base register (called array) and an offset (called count). The latter was shifted left twice (so as to multiply it by four) before being used so that 'word number' count was loaded.

An alternative way of writing this program can be seen in listing *Arm1*. If you compare this line by line with last month's listing, you'll notice that it is quite a bit shorter. This has two advantages, firstly it will occupy less memory and secondly it will execute quicker, both of which are probably desirable features.

AUTO-INCREMENT

So how does this new version work? Instead of loading the values from offsets from a base address, line 200 loads a value from the given address and automatically moves that address 'on' by the given amount, in this case four bytes or one word. In Basic, this instruction behaves like the pair:

```
value=!array
array+=4
```

. . . but all in one go – the adding of four takes no extra time because of the way the Arm works! The register array will therefore always point to the next value to be loaded from memory. Line 210 adds this value into the running total as before, but the looping is now somewhat different. Last month, there was another register called count that started off at zero and kept track of what element in the array was being 'dealt with', when it reached number the loop terminated.

Now, array automatically keeps track so we can do away with the count register and simply decrement number, the number of elements in memory. When this register reaches zero we will have added up all the elements of the array and the total can be passed back in R0.

Can we shorten a program and speed it up without some penalty? Well, there are cases when we can do this, but this is not one of them. If you take a careful look at the original version, you'll notice that (until the MOV R0,total) the values of locations array and number are both kept intact; array still points to the data at the end of the loop and number still contains the number of elements in the array.

In the new version, both of these registers are 'corrupted'; array will point to the memory location after the end of the array and number will contain zero. In most cases (like this one), this would not cause a problem as it would be quite likely that a piece of code such as this would actually form a subroutine (Basic PROC or, more appropriately in this case, FN) and that the original values would be preserved on a stack (we'll be meeting these very soon now) and restored at the end of the subroutine.

Alternatively, you could always make copies of the original array and number into, say, array2 and number2 and alter the code after .loop to use these instead. That way both array and number would be left untouched.

When it comes down to it, there is no right or wrong way to write such a piece of code. The first method preserves the variables, but will run fairly 'slowly', the second destroys the variables, but goes like an operand through a barrel shifter. The method to use will depend on the context of your program.

To complete the story on auto-incrementing, the value tacked on after the []s can either be a constant between -4095 and 4095 (both -0 and +0 are, again, allowed here) or a positive or negative register number.

```
LDRB R1, [addr], -R2
```

will therefore load R1 with one byte from address addr and then subtract R2 from addr.

AUTO-UPDATE

Going back a stage for a moment to the [base, offset] mode of addressing, if we add a single '!' after the ']' we inform the Arm that we want to permanently alter the value of the base register. In my descriptions of these instructions, such as:

```
LDRB R0, [R1, R2, ASL #2]
```

. . . I've said 'multiply R2 by 4, add it to R1 and load R0 with a single byte from that address'. All that changes with the extra '!' is that R1 actually becomes the address calculated. In a more simple example,

```
LDR R1, [addr,#4]!
```

The register addr will have four added to it, and R1 will be loaded from the new value of R1. This would be equivalent to the two instructions:

```
ADD addr, addr, #4
LDR R1, [addr]
```

. . . except that the ADD comes 'for free' – it takes up no extra memory or processor time. A negative offset would, of course, equate to a free SUB and, as expected, registers (with shifts) are all accepted:

```
LDR R2, [R3, -R4, LSR #1]!
```

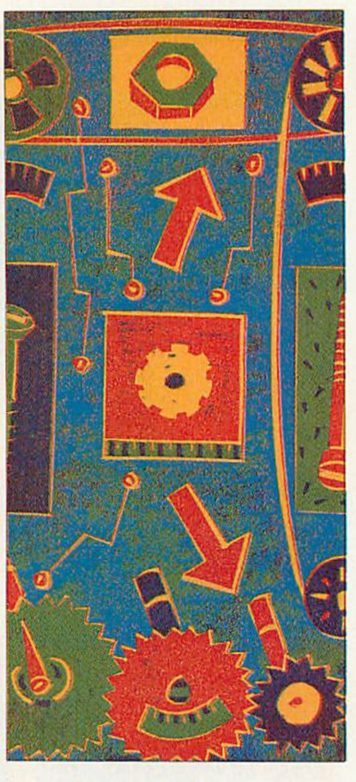
is equivalent to;

```
SUB R3, R3, R4, LSR #1
LDR R2, [R3]
```

The '!' is also referred to as write-back, as the calculated address is written back to the base register given. We will encounter '!' again with the LDM and STM instructions, when we move on to the use of stacks.

An example of how this works can be seen in this month's *Arm2* listing. I'm afraid we're back to the contrived examples again, but they do illustrate the point quite well. Eight four-letter words have been stored, starting at address words. These start with A, B, C, and so on to help identify them. The code at printword sets the register addr to point to this table with the ADR instruction. It also expects a number between zero and seven to be present in register R0. Other values should not be used as the result will be unpredictable, to say the least.

Line 150 multiplies R0 by four (there are four letters in each word) and adds this to addr, this will therefore now point to the first letter in the required word. Because we supplied a '!', addr will be 'written-back' with this new value. Line 150 also loads R0 with a single byte from this address. (All this is the result of one 32-bit instruction, and you thought the Arm was a reduced instruction set chip) Line 160 is a little bit of operating system magic that takes the value of R0 and prints the corresponding Ascii character on the screen.



We now need to print out the rest of the word. addr is still pointing to the first character in the word, so if we add one to it and load R0 from this address and again use that magic SWI call to print out the Ascii character, we'll get the second letter. This can then be repeated three times in total to print the whole word. Each time the process is undergone, write-back is used so that addr always points to the previous character printed. You could of course put these instructions in a loop (assuming that the register count has been aliased):

```
MOV count,#3
.loop
LDRB R0,[addr,#1]!
SWI "OS_WriteC"
SUBS count,count,#1
BNE loop
```

. . . this would save a little space, especially if you wanted to print, say, eight-letter words, but in practice, you'd never actually do this at all, as there is another magic operating system call to print out strings for you. If you're interested, *Arm3* contains a much more sensible version of *Arm2*. Line 180 is the clever call. This requires R0 to point to the string to print and R1 to contain the number of characters to print. OS_WriteN could be thought to mean 'print out n characters on the screen'. There are a number of other ways to print out strings, and we'll meet these in due course.

If you want a more 'English' way for thinking about auto-increment and auto-update, then just look at the various example instructions I have shown and think of the [ ] symbols as meaning 'look up what is at this address'. If these contain more than one register then they are added together – with a shift if necessary – before the memory is accessed.

If there is a '!' present, then the first register will be updated with the calculated address. If, on the other hand, there is a comma and a parameter after the [ ] then this is added to (or subtracted from) the register given in the [ ] after the memory access has been made. Another (again, technical) way of describing these variations is that:

```
LDR R0, [R1, R3]!
```

is pre-incremental and

```
LDR R0, [R1], R3
```

is post-incremental.

NEXT MONTH

We've nearly finished on arrays now. Next month I'll explain what statements are necessary to implement multi-dimensional arrays, although you may be able to work that one out for yourself by now.

For the time being, you might like to experiment with the various addressing modes that I have described in the last couple of issues, and make that sure you have a firm grasp of the assembly language concepts used. Also in next month's issue; the wonderful world of stacks. How can you possibly wait?

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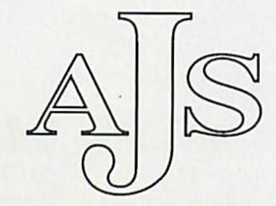
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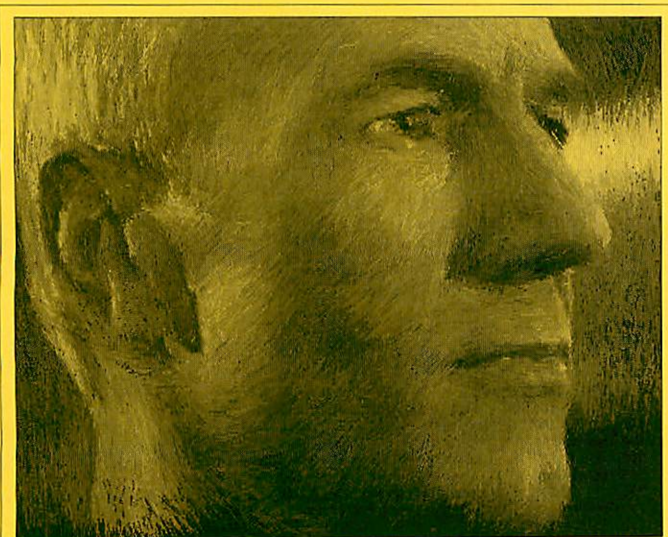


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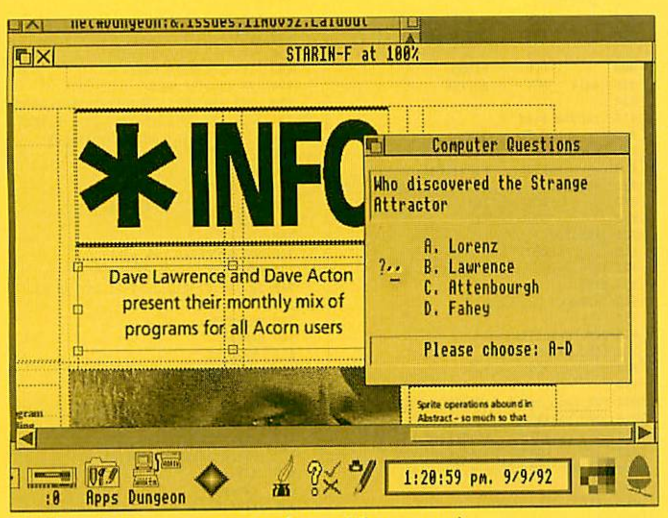
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COMPATIBILITY CHART

Use this chart to check if a program will work on your machine. There are two columns, one for eight-bit machines like the Model B and Master 128, and one for 32-bit machines, like the A3000, A400 or A3010. If there is a star for the program in the column then it will work on your machine. Special exceptions and hardware requirements are listed as foot notes at the end of the table.

Linked listings, those which require each other have a grey background, for example Info4 (*Pen32*) requires Info5 (*MakePen*) to generate a sprite file of a pen for it to use.

Article	Program Name	8-bit	32-bit
***INFO, page 81**			
Info1	*Abstract*		*
Info2	Gong1		*
Info3	*Gong2*		*
Info4	*Pen32*		*
Info5	*MakePen*		*
Info6	*Pen8*	*	
Info7	*!RunImage*		*
Info8	*MakeSpr*		*
Info9	*FireWks*	*	
Info10	*Flag*		*
Info11	*Register*		*
Info12	*ColDemo1*		*
Info13	*ColDemo2*		*
Info14	*ColDemo3*		*
Info15	*ColDemo4*		*
Info16	*ProcDem*	*	*
LOOK AND LEARN, page 85			
DeskLearn1	*!RunImage*		*
DeskLearn2	*MakeDat*		*
DeskLearn3 (a)	*MakeQuest*	*	*
DeskLearn4	*Learn8*	*	
ASSEMBLY LINE, page 89			
Arm1	*Arm1*		*
Arm2	*Arm2*		*
Arm3	*Arm3*		*

Notes: (a) Desklearn3 (*MakeQuest*) creates a question file for use with the 32-bit and the eight-bit versions.

*INFO

Listing 1 – Abstract

```
   10 REM >Abstract (Info1)
   20 REM by Adrian Skilling
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 PROCinitialise
   70 MOUSE lx,ly,mb
   80 REPEAT
   90 MOUSE mx,my,mb
  100 sx=mx-lx
  110 sy=my-ly
  120 lx=mx
  130 ly=my
  140 key=INKEY(0)
  150 IF key>=ASC"a" AND key<=ASC"z" key
-=32
  160 IF key=9  PROCensure:PROCscreenban
k(3-screenbank)
  170 IF key=ASC"S" PROCensure:PROCsave
  180 IF key=ASC"L" PROCensure:x=FNload:
PROCscreenbank(screenbank)
  190 IF key=ASC"U" PROCscreenbank(scree
nbank)
  200 CASE mb OF
  210 WHEN 4:PROCdraw(mx,my,sx,sy,mode,F
ALSE)
  220 WHEN 2:
  230 PROCensure
  240 mode=(mode MOD brushes)+1
  250 PRINTTAB(0,0);mode
  260 WHILE mb<>0
  270 MOUSE mx,my,mb
  280 ENDWHILE
  290 PROCscreenbank(screenbank)
  300 WHEN 1:PROCdraw(mx,my,sx,sy,mode,T
RUE)
  310 ENDCASE
  320 UNTIL FALSE
  330 :
  340 DEF PROCinitialise
  350 PROCconstants
  360 REPEAT UNTIL FNload
  370 ENDPROC
  380 :
  390 DEF PROCconstants
  400 DIM spr% &60000,name% 32,pres% &40
0
  410 !spr%=&60000
  420 screenbank=1
  430 density=10
  440 maxsize=40
  450 minsize=0
  460 rangemult=10
  470 sizemult=0.2
  480 mode=1
  490 brushes=5
  500 sprite_op%=&2E
  510 ENDPROC
  520 :
  530 DEF FNload
  540 MODE 0
  550 CLS
  560 *CAT
  570 INPUT "Sprite file: "name$
  580 SYS "XOS_File",5,name$ TO exists%
  590 IF exists%<>1 THEN =FALSE
  600 SYS sprite_op%,10+256,spr%,name$
  610 SYS sprite_op%,13+256,spr%,name%,3
2,1
  620 a%=name%
  630 WHILE ?a%>32
  640 a%+=1
  650 ENDWHILE
  660 ?a%=13
  670 sprite$=$name%
  680 SYS sprite_op%,40+256,spr%,sprite$
 TO ,,,sw%,sh%,,smode%
  690 SYS sprite_op%,15+256,spr%,"abs",,
sw%,sh%,smode%
  700 SYS "OS_ReadModeVariable",smode%,4
 TO ,,xeig
  710 SYS "OS_ReadModeVariable",smode%,5
 TO ,,yeig
  720 PROCscreenbank(1)
  730 =TRUE
  740 :
  750 DEF PROCsave
  760 MODE 0
  770 CLS
  780 *CAT
```

```
790 INPUT"Save as: "name$
800 PROCscreenbank(2)
810 SYS "XOS_CLI","ScreenSave "+name$
820 ENDPROC
830 :
840 DEF PROCdraw(mx,my,sx,sy,mode,erase%)
850 colour=0
860 tint=0
870 size=FNsize(sx,sy)
880 dsize=size*rangemult
890 IF screenbank=1 THEN
900 !pres%=0
910 SYS sprite_op%,60+256,spr%,"abs" TO r0,r1,r2,r3
920 ENDIF
930 PROCchecksize(sx,sy)
940 FOR t=0 TO density
950 px=mx-dsize/2+RND(dsize):py=my-dsize/2+RND(dsize)
960 IF NOT(erase%) THEN PROCspritecolour(px,py,colour,tint)
970 GCOL colour TINT tint
980 CASE mode OF
990 WHEN 1:MOVE px,py:DRAW BY sx,sy
1000 WHEN 2:CIRCLE FILL px,py,size
1010 WHEN 3:RECTANGLE FILL px,py,size,size
1020 WHEN 4:MOVE px,py:DRAW BY (RND(200)-100)/100*size,(RND(200)-100)/100*size
1030 WHEN 5:MOVE px,py:MOVE px+(RND(200)-100)/100*size,py+(RND(200)-100)/100*size:PLOT 85,px+(RND(200)-100)/100*size,py+(RND(200)-100)/100*size
1040 ENDCASE
1050 NEXT
1060 IF screenbank=1 THEN SYS sprite_op%,r0,r1,r2,r3
1070 ENDPROC
1080 :
1090 DEF FNsize(sx,sy)
1100 LOCAL size
1110 size=SQR(sx*sx+sy*sy)*sizemult
1120 IF size>maxsize THEN =maxsize
1130 IF size<minsize THEN =minsize
1140 =size
1150 :
1160 DEF PROCchecksize(RETURN sx,RETURN sy)
1170 LOCAL size
1180 size=SQR(sx*sx+sy*sy)
1190 IF size<>0 THEN
1200 IF size>maxsize THEN sx=sx/size*maxsize:sy=sy/size*maxsize
1210 IF size<minsize THEN sx=sx/size*minsize:sy=sy/size*minsize
1220 ENDIF
1230 ENDPROC
1240 :
1250 DEF PROCspritecolour(px,py,RETURN colour,RETURN tint)
1260 px=px>>xeig
1270 py=py>>yeig
1280 IF px<0 px=0 ELSE IF px>sw%-1 px=sw%-1
1290 IF py<0 py=0 ELSE IF py>sh%-1 py=sh%-1
1300 SYS sprite_op%,41+256,spr%,sprite$,px,py TO ,,,,,colour,tint
1310 ENDPROC
1320 :
1330 DEF PROCscreenbank(n)
1340 LOCAL s$
1350 IF MODE<>smode% MODE smode%:OFF:MOUSE ON
1360 VDU 24,0;0;(sw%<<xeig)-1;(sh%<<yeig)-1;
1370 screenbank=n
1380 IF n=1 s$=sprite$ ELSE s$="abs"
1390 SYS sprite_op%,34+256,spr%,s$,0,0,0
1400 ENDPROC
1410 :
1420 DEF PROCensure
1430 IF screenbank=2 THEN SYS sprite_op%,16+256,spr%,"abs",,0,0,(sw%<<xeig)-1,(sh%<<yeig)-1
1440 ENDPROC
```

Listing 2 – Gong1

```
10 REM >Gong1 (Info2)
20 REM Psychedelic graphics
30 REM by Steve Harris
40 REM for 32-bit machines
50 REM (c) BAU November 1992
60 :
70 ON ERROR PRINT REPORT$;" at line ";ERL:END
80 :
90 size%=&400
100 DIM in% 16,out% 16,code% size%
110 !in%=149
120 in%!4=-1
130 MODE 13
140 OFF
150 PROCassemble
160 FOR y%=0 TO 1023 STEP 4
170 GCOL FNcol(y%)
180 POINT 0,y%
190 NEXT
200 FOR x%=0 TO 1279 STEP 4
210 GCOL FNcol(x%)
220 POINT x%, 1023
230 NEXT
240 CALL code%
250 IF GET
260 END
270 :
280 DEF FNcol(c%)
290 =c%+TIME
300 :
310 DEF PROCassemble
320 t=0:seed=1:xor=2:x=3:y=4
330 base=5:tp=6:tt=7:ptr=8:val=9
340 ok=11:tk=12:sp=13
350 :
360 FOR pass%=0 TO 10 STEP 2
370 P%=code%:L%=P%+size%
380 [OPT pass%
390 .init  ADR    r0,in%
400        ADR    r1,out%
410        SWI    "OS_ReadVduVariables"
420        MVN    r0,#0
430        MOV    r1,#7
440        SWI    "OS_ReadModeVariable"
450        ADR    r0,out%
460        LDR    base,[r0]
470        LDR    xor,eor_value
480        LDR    seed,random_seed
490        MOV    tk,#2048
500        SUB    tk,tk,#1
510        MOV    ok,#1024
520        SUB    ok,ok,#1
530
540        MOV    x,#1
550 .xloop MOV    y,#1
560 .yloop SUB    tp,y,#1
570        MOV    ptr,tp,LSL #6
580        ADD    ptr,ptr,tp,LSL #8
590        ADD    ptr,ptr,x
600        ADD    ptr,base,ptr
610        LDRB   tt,[ptr]
620
630        SUB    tp,x,#1
640        MOV    ptr,y,LSL #6
650        ADD    ptr,ptr,y,LSL #8
660        ADD    ptr,ptr,tp
670        ADD    ptr,base,ptr
680        LDRB   ptr,[ptr]
690        ADD    tt,ptr,tt
700        MOV    val,tt,LSR #1
710
720 .random MOV   t,#0
730 ]
740 FOR rand_loop%=1 TO 15
750 [OPT pass%
760        MOVS   seed,seed,LSL #1
770        EORCS  seed,seed,xor
780        ADC    t,t,t
790 ]
800 NEXT
810 [OPT pass%
820        AND    tt,t,tk
830        SUBS   tt,tt,ok
840        ADD    val,val,tt,LSR #14
850        MOV    ptr,y,LSL #6
860        ADD    ptr,ptr,y,LSL #8
870        ADD    ptr,ptr,x
880        ADD    ptr,base,ptr
890        STRB   val,[ptr]
900        ADD    y,y,#1
910        CMP    y,#256
920        BLT    yloop
930        SWI    "OS_ReadEscapeState"
940        BCS    exit
950        ADD    x,x,#1
960        CMP    x,#320
970        BLT    xloop
980 .exit  MOV    pc,r14
990
1000 .random_seed
1010       EQUD   TIME
1020 .eor_value
1030       EQUD   &1D872B41
1040 ]
1050 NEXT
1060 ENDPROC
```

Listing 3 – Gong2

```
10 REM >Gong2 (Info3)
20 REM (y-scrolling,colour cycling)
30 REM by Steve Harris
40 REM for 32-bit machines
50 REM (c) BAU November 1992
60 :
70 ON ERROR PRINT REPORT$;" at line ";ERL:END
80 :
90 power%=5
100 speed%=1
110 cycle%=TRUE
120 size%=&400
130 DIM code% size%
140 PROCassemble
150 CALL code%
160 END
170 :
180 DEF PROCassemble
190 r=0:tt=1:tp=2:x=3
200 y=4:base=5:xor=6:seed=7
210 ptr=8:val=9:ok=10:tk=11
220 end=12:sp=13
230 :
240 FOR pass%=0 TO 10 STEP 2
250 P%=code%:L%=P%+size%
260 [OPT pass%
270 .init_vars_and_regs
280        SWI    256+22
290        SWI    256+13
300        SWI    "OS_RemoveCursors"
310        ADR    r0,ReadVduV1
320        ADR    r1,ReadVduV2
330        SWI    "OS_ReadVduVariables"
340        LDR    base,ReadVduV2
350        LDR    xor,xor_value
360        LDR    seed,random_seed
370        MOV    tk,#1<<(power%+1)
380        SUB    tk,tk,#1
390        MOV    ok,#1<<power%
400        SUB    ok,ok,#1
410        ADD    ptr,base,#320
420        ADD    end,base,#&14000
430        SUB    end,end,#320*speed%
440        MOV    x,#320
450        MOV    y,#1
460 .initscreen
470        FNrand(8)
480        STRB   r,[base,x]
490        SUBS   x,x,#1
500        BNE    initscreen
510 .yloop MOV    x,#1
520        FNrand(8)
530        STRB   r,[ptr],#1
540 .xloop LDRB   tt,[ptr,#-320]
550        LDRB   tp,[ptr,#-1]
560        ADD    tt,tt,tp
570        MOV    val,tt,LSR #1
580        FNrand(power%+1)
590        AND    tt,r,tk
600        SUB    tt,tt,ok
610        ADD    val,val,tt,LSR #power%
620        STRB   val,[ptr],#1
630        ADD    x,x,#1
640        CMP    x,#320
650        BLT    xloop
660        ADD    y,y,#1
670        CMP    y,#256
680        BLT    yloop
690 .moveupinit
700        MOV    ptr,base
710 .moveuploop
720        LDR    r,[ptr,#320*speed%]
730        FNcycle
740        STR    r,[ptr],#4
750        CMP    ptr,end
760        BNE    moveuploop
770 .moveupend
780        MOV    y,#256-speed%
790        SWI    "OS_ReadEscapeState"
800        BCC    yloop
810 .exit  MOV    pc,r14
820
830 .random_seed
840        EQUD   TIME
850 .xor_value
860        EQUD   &1D872B41
870 .ReadVduV1
880        EQUD   148
890        EQUD   -1
900 .ReadVduV2
910        EQUD   0
920 ]
930 NEXT
940 ENDPROC
950
960 DEF FNrand(l%)
970 [OPT pass%
980        MOV    r,#0
990 ]
1000 FOR rand_loop%=1 TO l%
1010 [OPT pass%
1020       MOVS   seed,seed,LSL #1
1030       EORCS  seed,seed,xor
1040       ADC    r,r,r
1050 ]
1060 NEXT
1070 =0
1080
1090 DEF FNcycle
1100 IF NOT cycle%:=0
1110 [OPT pass%
1120       ANDS   tt,r,#%11111111
1130       ORREQ  r,r,#%11111111
1140       SUBNE  r,r,#1
1150       ANDS   tt,r,#%11111111<<8
1160       ORREQ  r,r,#%11111111<<8
1170       SUBNE  r,r,#1<<8
1180       ANDS   tt,r,#%11111111<<16
1190       ORREQ  r,r,#%11111111<<16
1200       SUBNE  r,r,#1<<16
1210       ANDS   tt,r,#%11111111<<24
1220       ORREQ  r,r,#%11111111<<24
1230       SUBNE  r,r,#1<<24
1240 ]
1250 =0
```

Listing 4 – Pen32

```
10 REM >Pen32 (Info4)
20 REM by Jan Vibe
30 REM for 32-bit machines
40 REM (c) BAU November 1992
50 :
60 MODE 140
70 MODE 12
80 OFF
90 s1%=1:s2%=2:z%=8:px%=0:py%=800
100 DIM gx%(2),gy%(2),spr &3000,vl 255
110 ON ERROR GOTO 1740
120 file$="Text"
130 PROCinit
140 ch%=OPENIN(file$)
150 REPEAT
160 k%=BGET#ch%
170 IF k%>32 THEN
180   IF (k%>=97 AND k%<=122) k%-=32
190   txt$+=CHR$(k%)
200 ELSE
210   IF 5.5*z%*LEN(txt$)+px%>1248 THEN
220     px%=0
230     py%-=8*z%
240     IF py%<10*z% PROCnp
250   ENDIF
260   PROCw(txt$)
270   txt$=""
280   IF k%=10 THEN
290     px%=0
300     py%-=8*z%
310     IF py%<10*z% PROCnp
320   ENDIF
330 ENDIF
340 UNTIL EOF#ch%
350 CLOSE#ch%
360 *FX 15
370 PROCl(x1%,y1%,32,32,0)
380 SYS 6,112,s1%
390 SYS 6,113,s1%
400 ON
410 END
420 :
430 DEF PROCnp
440 LOCAL n%,dy%
450 dy%=4*((800-py%)DIV4)
460 FOR n%=1 TO dy%/4
470   MOVE 0,0
480   MOVE 1278,1020
490   PLOT &BD,0,4
500 NEXT
510 SYS 6,112,s1%
520 MOVE 0,0
530 MOVE 1278,1020
540 PLOT &BD,0,dy%
550 SYS 6,112,s2%
560 py%+=dy%
570 gy%(1)+=dy%
580 gy%(2)+=dy%
590 y1%+=dy%
600 y2%+=dy%
610 ENDPROC
620 :
630 DEF PROCw(txt$)
640 LOCAL n%,l$
650 FOR n%=1 TO LEN(txt$)
660   l$=MID$(txt$,n%,1)
670   IF l$<>"" THEN
680     IF INSTR("ABCDEFGHIJKLMNOPQRSTUVWXYZ(|),.()-?':!0123456789",l$)<>0 THEN
690       PROCb(l$,5.5*z%*n%+px%,py%)
700     ENDIF
710   ENDIF
720 NEXT
730 px%+=z%*5.5*(LEN(txt$)+1)
740 ENDPROC
750 :
760 DEF PROCb(a$,px%,py%)
770 LOCAL b$,a%,n%,p%,x%,y%
780 IF INSTR("0123456789",a$)<>0 a$="'"+a$+"'"
790 RESTORE
800 REPEAT
810   READ b$
820 UNTIL b$=a$
830 READ a%
840 FOR n%=1 TO a%
850   READ p%,x%,y%
860   x%=x%*z%+px%+4-RND(8)
870   y%=y%*z%+py%+4-RND(8)
880   x2%=x1%
890   y2%=y1%
900   x1%=x%
910   y1%=y%
920   PROCl(x2%,y2%,x1%,y1%,p%)
930 NEXT
940 ENDPROC
950 :
960 DEF PROCl(x2%,y2%,x1%,y1%,l%)
970 LOCAL d%,n%,xa%,ya%,xb%,yb%,k%
980 k%=20
990 IF l%=1 k%=12
1000 d%=SQR((x2%-x1%)^2+(y2%-y1%)^2)/k%
1010 IF d%<>0 THEN
1020   xa%=x2%
1030   ya%=y2%
1040   FOR n%=0 TO d%
1050     xb%=((d%-n%)*x2%+n%*x1%)/d%
1060     yb%=((d%-n%)*y2%+n%*y1%)/d%
1070     PROCpen(xb%,yb%,xa%,ya%,l%)
1080     xa%=xb%
1090     ya%=yb%
1100   NEXT
1110 ELSE
1120   PROCpen(x1%,y1%,x1%,y1%,l%)
1130   PROCpen(x1%,y1%,x1%,y1%,l%)
1140 ENDIF
1150 PROCpen(x1%,y1%,x1%,y1%,l%)
1160 ENDPROC
1170 :
1180 DEF PROCpen(x2%,y2%,x1%,y1%,l%)
1190 LOCAL h%,n$
1200 SYS 6,112,s1%
1210 SYS 6,113,s2%
```

```
 1220 SWAP s1%,s2%
 1230 n$=STR$(s1%)
 1240 SYS "OS_SpriteOp",256+34,spr,n$,gx
%(s1%),gy%(s1%),0
 1250 IF l%=1 THEN
 1260  LINE gx%(s1%),gy%(s1%),x1%,y1%
 1270  SYS 6,113,s1%
 1280  LINE gx%(s2%),gy%(s2%),x2%,y2%
 1290  SYS 6,113,s2%
 1300 ENDIF
 1310 SYS "OS_SpriteOp",256+16,spr,n$,0,
x2%,y2%,wt%+x2%,ht%+y2%
 1320 SYS "OS_SpriteOp",256+34,spr,"penc
il",x2%,y2%,8
 1330 gx%(s1%)=x2%
 1340 gy%(s1%)=y2%
 1350 WAIT
 1360 ENDPROC
 1370 :
 1380 DEF PROCinit
 1390 COLOUR 8,255,128,128
 1400 COLOUR 135
 1410 COLOUR0
 1420 GCOL 0
 1430 GCOL 135
 1440 spr!0=&2FFF
 1450 spr!4=0
 1460 spr!8=16
 1470 spr!12=16
 1480 pen$="Pencil"
 1490 SYS "OS_SpriteOp",256+10,spr,pen$
 1500 SYS "OS_SpriteOp",256+40,spr,"penc
il" TO,,,wt%,ht%
 1510 wt%=2*wt%
 1520 ht%=4*ht%
 1530 SYS 6,112,s1%
 1540 SYS 6,113,s2%
 1550 SWAP s1%,s2%
 1560 CLS
 1570 SYS 6,112,s1%
 1580 SYS 6,113,s2%
 1590 SWAP s1%,s2%
 1600 CLS
 1610 gx%(1)=32
 1620 gy%(1)=32
 1630 gx%(2)=32
 1640 gy%(2)=32
 1650 x1%=32
 1660 y1%=32
 1670 x2%=32
 1680 y2%=32
 1690 txt$=""
 1700 SYS "OS_SpriteOp",256+16,spr,"1",0
,32,32,wt%+32,ht%+32
 1710 SYS "OS_SpriteOp",256+16,spr,"2",0
,32,32,wt%+32,ht%+32
 1720 ENDPROC
 1730 :
 1740 CLOSE #ch%
 1750 SYS 6,112,s1%:SYS6,113,s1%
 1760 REPORT:PRINT" at line "STR$ERL:ON
 1770 END
 1780 :
 1790 DATA A,5
 1800 DATA 0,0,0, 1,2,6, 1,4,0, 0,1,3, 1
,3,3
 1810 DATA B,12
 1820 DATA 0,0,0, 1,0,6, 1,3,6, 1,4,5, 1
,4,4, 1,3,3, 1,4,2, 1,4,1, 1,3,0
 1830 DATA 1,0,0, 0,0,3, 1,3,3
 1840 DATA C,8
 1850 DATA 0,4,1, 1,3,0, 1,1,0, 1,0,1, 1
,0,5, 1,1,6, 1,3,6, 1,4,5
 1860 DATA D,7
 1870 DATA 0,0,0, 1,0,6, 1,3,6, 1,4,5, 1
,4,1, 1,3,0, 1,0,0
 1880 DATA E, 6
 1890 DATA 0,4,0, 1,0,0, 1,0,6, 1,4,6, 0
,0,3, 1,2,3
 1900 DATA F,5
 1910 DATA 0,0,0, 1,0,6, 1,4,6, 0,0,3, 1
,2,3
 1920 DATA G,10
 1930 DATA 0,2,3, 1,4,3, 1,4,1, 1,3,0, 1
,1,0, 1,0,1, 1,0,5, 1,1,6, 1,3,6
 1940 DATA 1,4,5
 1950 DATA H,6
 1960 DATA 0,0,0, 1,0,6, 0,0,3, 1,4,3, 0
,4,0, 1,4,6
 1970 DATA I,6
 1980 DATA 0,1,0, 1,3,0, 0,2,0, 1,2,6, 0
,1,6, 1,3,6
 1990 DATA J,8
 2000 DATA 0,1,6, 1,4,6, 0,3,6, 1,3,1, 1
,2,0, 1,1,0, 1,0,1, 1,0,2
 2010 DATA K,5
 2020 DATA 0,0,0, 1,0,6, 0,4,0, 1,0,3, 1
,4,6
 2030 DATA L,3
 2040 DATA 0,4,0, 1,0,0, 1,0,6
 2050 DATA M,5
 2060 DATA 0,0,0, 1,0,6, 1,2,3, 1,4,6, 1
,4,0
 2070 DATA N,4
 2080 DATA 0,0,0, 1,0,6, 1,4,0, 1,4,6
 2090 DATA O,9
 2100 DATA 0,0,1, 1,0,5, 1,1,6, 1,3,6, 1
,4,5, 1,4,1, 1,3,0, 1,1,0, 1,0,1
 2110 DATA P,7
 2120 DATA 0,0,0, 1,0,6, 1,3,6, 1,4,5, 1
,4,4, 1,3,3, 1,0,3
 2130 DATA Q,11
 2140 DATA 0,0,1, 1,0,5, 1,1,6, 1,3,6, 1
,4,5, 1,4,1, 1,3,0, 1,1,0, 1,0,1
 2150 DATA 0,3,1, 1,4,0
 2160 DATA R,9
 2170 DATA 0,0,0, 1,0,6, 1,3,6, 1,4,5, 1
,4,4, 1,3,3, 1,0,3, 0,2,3, 1,4,0
 2180 DATA S,12
 2190 DATA 0,0,1, 1,1,0, 1,3,0, 1,4,1, 1
,4,2, 1,3,3, 1,1,3, 1,0,4, 1,0,5
 2200 DATA 1,1,6, 1,3,6, 1,4,5
 2210 DATA T,4
 2220 DATA 0,2,0, 1,2,6, 0,0,6, 1,4,6
 2230 DATA U,6
 2240 DATA 0,0,6, 1,0,1, 1,1,0, 1,3,0, 1
,4,1, 1,4,6
 2250 DATA V,3
 2260 DATA 0,0,6, 1,2,0, 1,4,6
 2270 DATA W,5
 2280 DATA 0,0,6, 1,0,0, 1,2,3, 1,4,0, 1
,4,6
 2290 DATA X,4
 2300 DATA 0,0,0, 1,4,6, 0,0,6, 1,4,0
 2310 DATA Y,5
 2320 DATA 0,0,6, 1,2,3, 1,4,6, 0,2,0, 1
,2,3
 2330 DATA Z,4
 2340 DATA 0,4,0, 1,0,0, 1,4,6, 1,0,6
 2350 DATA {,9
 2360 DATA 0,0,0, 1,0,3, 1,2,6, 1,2,0, 1
,4,0, 0,0,3, 1,3,3, 0,2,6, 1,4,6
 2370 DATA |,11
 2380 DATA 0,0,1, 1,0,5, 1,1,6, 1,3,6, 1
,4,5, 1,4,1, 1,3,0, 1,1,0, 1,0,1
 2390 DATA 0,0,0, 1,4,6
 2400 DATA },13
 2410 DATA 0,0,0, 1,0,3, 1,1,4, 1,3,4, 1
,4,3, 1,4,0, 0,0,2, 1,4,2, 0,2,4
 2420 DATA 1,1,5, 1,2,6, 1,3,5, 1,2,4
 2430 DATA ",",2
 2440 DATA 0,1,0, 1,2,1
 2450 DATA .,2
 2460 DATA 0,2,0, 1,2,0
 2470 DATA (,4
 2480 DATA 0,2,0, 1,1,2, 1,1,4, 1,2,6
 2490 DATA ),4
 2500 DATA 0,2,0, 1,3,2, 1,3,4, 1,2,6
 2510 DATA -,2
 2520 DATA 0,1,3, 1,3,3
 2530 DATA ?,10
 2540 DATA 0,0,4, 1,0,5, 1,1,6, 1,3,6, 1
,4,5, 1,4,4, 1,2,2, 1,2,2
 2550 DATA 0,2,0, 1,2,0
 2560 DATA ',2
 2570 DATA 0,2,6, 1,2,5
 2580 DATA :,4
 2590 DATA 0,2,1, 1,2,1, 0,2,5, 1,2,5
 2600 DATA !,4
 2610 DATA 0,2,6, 1,2,2, 0,2,0, 1,2,0
 2620 DATA '0',9
 2630 DATA 0,0,1, 1,0,5, 1,1,6, 1,3,6, 1
,4,5, 1,4,1, 1,3,0, 1,1,0, 1,0,1
 2640 DATA '1',5
 2650 DATA 0,1,5, 1,2,6, 1,2,0, 0,1,0, 1
,3,0
 2660 DATA '2',7
 2670 DATA 0,0,5, 1,1,6, 1,3,6, 1,4,5, 1
,4,4, 1,0,0, 1,4,0
 2680 DATA '3',13
 2690 DATA 0,0,1, 1,1,0, 1,3,0, 1,4,1, 1
,4,2, 1,3,3, 1,2,3, 0,3,3, 1,4,4
 2700 DATA 1,4,5, 1,3,6, 1,1,6, 1,0,5
 2710 DATA '4',4
 2720 DATA 0,3,0, 1,3,6, 1,0,3, 1,4,3
 2730 DATA '5',10
 2740 DATA 0,0,1, 1,1,0, 1,3,0, 1,4,1, 1
,4,3, 1,3,4, 1,1,4, 1,0,3, 1,0,6
 2750 DATA 1,4,6
 2760 DATA '6',12
 2770 DATA 0,0,3, 1,1,4, 1,3,4, 1,4,3, 1
,4,1, 1,3,0, 1,1,0, 1,0,1, 1,0,5
 2780 DATA 1,1,6, 1,3,6, 1,4,5
 2790 DATA '7',3
 2800 DATA 0,0,6, 1,4,6, 1,0,0
 2810 DATA '8',16
 2820 DATA 0,1,3, 1,0,4, 1,0,5, 1,1,6, 1
,3,6, 1,4,5, 1,4,4, 1,3,3, 1,1,3
 2830 DATA 1,0,2, 1,0,1, 1,1,0, 1,3,0, 1
,4,1, 1,4,2, 1,3,3
 2840 DATA '9',12
 2850 DATA 0,4,3, 1,3,2, 1,1,2, 1,0,3, 1
,0,5, 1,1,6, 1,3,6, 1,4,5, 1,4,1
 2860 DATA 1,3,0, 1,1,0, 1,0,1
 2870 DATA "END"
```

Listing 5 – MakePen

```
   10 REM >MakePen (Info5)
   20 REM Create sprites for Pen32
   30 REM by Jan Vibe
   40 REM for 32-bit machines
   50 REM (c) BAU November 1992
   60 :
   70 MODE 12
   80 OFF
   90 DIM spr &28000
  100 spr!0=&27FFF
  110 spr!4=0
  120 spr!8=16
  130 spr!12=16
  140 w%=128
  150 h%=256
  160 COLOUR 8,255,128,128
  170 RECTANGLE FILL 0,0,w%,h%
  180 GCOL 128+7
  190 GCOL 0
  200 MOVE 0,0
  210 DRAW 8,32
  220 DRAW 24,24
  230 DRAW 0,0
  240 MOVE 8,32
  250 DRAW 112,240
  260 DRAW 128,232
  270 DRAW 24,24
  280 GCOL 8
  290 FILL 8,16
  300 GCOL 6
  310 FILL 24,32
  320 GCOL 0
  330 SYS "OS_SpriteOp",256+16,spr,"penc
il",0,0,0,w%,h%
  340 SYS "OS_SpriteOp",256+29,spr,"penc
il"
  350 FOR y%=0 TO h% STEP 4
  360 FOR x%=0 TO w% STEP 2
  370 S%=1
  380 IF POINT(x%,y%)=7 S%=0:POINT x%,y%
  390 SYS"OS_SpriteOp",256+44,spr,"penci
l",x%/2,y%/4,S%
  400 NEXT
  410 NEXT
  420 SYS "OS_SpriteOp",256+12,spr,"Penc
il"
  430 END
```

Listing 6 – Pen8

```
   10 REM >Pen8 (Info6)
   20 REM by DCA, based on Pen32 by Jan
Vibe
   30 REM for all machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 4
   70 VDU 23;8202;0;0;0;
   80 PROCinit
   90 PROCtext
  100 END
  110 :
  120 DEF PROCtext
  130 CLS
  140 in%=OPENIN"text"
  150 word$=""
  160 REPEAT
  170 IF NOT EOF#in% c%=BGET#in% ELSE c%
=32
  180 IF c%>=ASC"a" AND c%<=ASC"z" c%=c%
-32
  190 IF c%>32 word$=word$+CHR$c%
  200 IF c%<=32 AND word$<>"" PROCdo_wor
d(word$):word$=""
  210 UNTIL EOF#in%
  220 CLOSE#in%
  230 ENDPROC
  240 :
  250 DEF PROCinit
  260 lm%=32
  270 px%=lm%
  280 py%=900
  290 size%=12
  300 space%=4
  310 DIM p%(255),l%(255)
  320 DIM data% &480
  330 PRINT"Please wait..."
  340 FOR i%=0 TO 255
  350 l%(i%)=space%
  360 NEXT
  370 p%=data%
  380 REPEAT
  390 READ c$
  400 IF LEN(c$)=3 AND LEFT$(c$,1)="'" c
$=MID$(c$,2,1)
  410 IF c$<>"END" PROCadd_char(ASC(c$))
  420 UNTIL c$="END"
  430 ENDPROC
  440 :
  450 DEF PROCadd_char(c%)
  460 p%(c%)=p%
  470 READ n%
  480 ?p%=n%
  490 p%=p%+1
  500 FOR i%=1 TO n%
  510 READ a%,x%,y%
  520 ?p%=a%
  530 p%?1=x%
  540 p%?2=y%
  550 p%=p%+3
  560 IF y%>l%(c%) l%(c%)=y%
  570 NEXT
  580 ENDPROC
  590 :
  600 DEF PROCdo_word(word$)
  610 LOCAL i%,c$,width%
  620 width%=0
  630 FOR i%=1 TO LEN(word$)
  640 width%=width%+l%(ASCMID$(word$,i%)
)
  650 NEXT
  660 IF px%>lm% AND px%+size%*(space%+w
idth%)>1200 PROCnew_line
  670 IF px%>lm% px%=px%+size%*space%
  680 FOR i%=1 TO LEN(word$)
  690 c%=ASCMID$(word$,i%)
  700 IF px%+size%*l%(c%)>1200 PROCnew_l
ine
  710 IF p%(c%)>0 PROCshow_char(c%)
  720 px%=px%+size%*l%(c%)
  730 NEXT
  740 ENDPROC
  750 :
  760 DEF PROCshow_char(c%)
  770 LOCAL i%,n%,p%
  780 n%=?p%(c%)
  790 p%=p%(c%)+1
  800 FOR i%=1 TO n%
  810 PLOT 4+?p%,px%+size%*p%?1+RND(8)-4
,py%+size%*p%?2+RND(8)-4
  820 p%=p%+3
  830 NEXT
  840 ENDPROC
  850 :
  860 DEF PROCnew_line
  870 px%=lm%
  880 py%=py%-9*size%
  890 IF py%<2*size% REPEAT:VDU 31,0,31,
10:py%=py%+32:UNTIL py%>=2*size%
  900 ENDPROC
  910 :
  920 DEF FNmax_width
  930 LOCAL n%,i%,max%,p%,x%,y%
  940 READ n%
  950 max%=-1
  960 FOR i%=1 TO n%
  970 READ p%,x%,y%
  980 IF x%>max% max%=x%
  990 NEXT
 1000 =max%
 1010 :
 1020 REM Append DATA here...
```

Listing 7 – !RunImage

```
   10 REM >!RunImage (Info7)
   20 REM Pointer
   30 REM by Graham Kendall
   40 REM for 32-bit machines
   50 REM (c) BAU November 1992
   60 :
   70 appl$="Pointer"
   80 PROCinit
   90 REPEAT
  100 PROCpoll
  110 UNTIL exit%
  120 SYS "Wimp_CloseDown"
  130 END
  140 :
  150 DEF PROCinit
  160 DIM block% &100,menu% 80,work% 300
  170 exit%=FALSE
  180 SYS "Wimp_Initialise",200,&4B53415
4,appl$
  190 block%!0=-1
  200 block%!4=0:block%!8=0
  210 block%!12=68:block%!16=68
  220 block%!20=&301A
  230 $(block%+24)="!Pointer"+CHR$0
  240 SYS "Wimp_CreateIcon",,block% TO i
conhandle%
  250 $menu%=appl$
  260 menu%?12=7:menu%?13=2
  270 menu%?14=7:menu%?15=0
  280 menu%!16=12+16*5
  290 menu%!20=44:menu%!24=0
  300 menu%!28=0:menu%!32=-1
  310 menu%!36=&7009031
  320 $(menu%+40)="Stop"+CHR$0
  330 menu%!52=&80:menu%!56=-1
  340 menu%!60=&7009031
  350 $(menu%+64)="Quit"+CHR$0
  360 stop%=FALSE
  370 PROCget_size
  380 ENDPROC
  390 :
  400 DEF PROCpoll
  410 SYS "Wimp_Poll",&1830,block% TO re
ason%
  420 CASE reason% OF
  430 WHEN 0:IF NOT stop% PROCchkptr
  440 WHEN 6:PROCmouseclick
  450 WHEN 9:PROCmenusel:IF but%=1 SYS "
Wimp_CreateMenu",,menu%,!block%-64,184
  460 WHEN 17,18:PROCmessage
  470 ENDCASE
  480 ENDPROC
  490 :
  500 DEF PROCmouseclick
  510 IF block%!8=2 SYS "Wimp_CreateMenu
",,menu%,!block%-64,184
  520 ENDPROC
  530 :
  540 DEF PROCmessage
  550 IF block%!16=0 SYS "Wimp_CloseDown
":END
  560 IF block%!16=&400C1 PROCget_size
  570 ENDPROC
  580 :
  590 DEF PROCmenusel
  600 SYS "Wimp_GetPointerInfo",,work%
  610 msex%=!work%
  620 msey%=!(work%+4)
  630 but%=!(work%+8)
  640 !work%=!(work%+12)
  650 SYS "Wimp_GetWindowInfo",,work%
  660 IF (msey%-!(work%+8))<44 THEN
  670 exit%=TRUE
  680 ELSE
  690 IF stop% THEN
  700 menu%!28=&0
  710 stop%=FALSE
  720 ELSE
  730 menu%!28=&1
  740 stop%=TRUE
  750 ENDIF
  760 ENDIF
  770 ENDPROC
  780 :
  790 DEF PROCchkptr
  800 MOUSE mx%,my%,b%
  810 nx%=mx%
  820 ny%=my%
  830 IF mx%>=sx% nx%=0
  840 IF mx%=0 nx%=sx%
```

```
  850 IF my%>=sy% ny%=0
  860 IF my%=0 ny%=sy%
  870 IF nx%<>mx% OR ny%<>my% MOUSE TO n
x%,ny%
  880 ENDPROC
  890 :
  900 DEF PROCget_size
  910 sx%=FNmv(11)<<FNmv(4)
  920 sy%=FNmv(12)<<FNmv(5)
  930 ENDPROC
  940 :
  950 DEF FNmv(m%)
  960 SYS "OS_ReadModeVariable",-1,m% TO
,,m%
  970 =m%
```

Listing 8 – MakeSpr

```
   10 REM >MakeSpr (Info8)
   20 REM Create sprites for !Pointer
   30 REM Sprite design by Graham Kendal
l
   40 REM for 32-bit machines
   50 REM (c) BAU November 1992
   60 :
   70 MODE 12
   80 DIM sp% 800
   90 !sp%=800
  100 sp%!4=0
  110 sp%!8=16
  120 sp%!12=16
  130 GCOL 7
  140 RECTANGLE 0,0,34*2-1,17*4-1
  150 GCOL 15
  160 RECTANGLE FILL 0,5*4,10*2-1,3*4-1
  170 RECTANGLE FILL 24*2,5*4,10*2-1,3*4
-1
  180 MOVE 16*2,6*4
  190 MOVE 24*2,2*4
  200 PLOT 85,24*2,10*4
  210 GCOL 8
  220 LINE 0,6*4,9*2-1,6*4
  230 LINE 24*2,6*4,34*2-1,6*4
  240 MOVE 18*2,6*4
  250 MOVE 23*2,4*4
  260 PLOT 85,23*2,8*4
  270 MOVE 0,0
  280 MOVE 34*2-1,17*4-1
  290 SYS "OS_SpriteOp",16+256,sp%,"!poi
nter",,0,0,34*2-1,17*4-1
  300 SYS "OS_SpriteOp",29+256,sp%,"!poi
nter"
  310 FOR i%=0 TO 33
  320 FOR j%=0 TO 16
  330 SYS "OS_SpriteOp",44+256,sp%,"!poi
nter",i%,j%,ABS(POINT(2*i%,4*j%)>0)
  340 NEXT
  350 NEXT
  360 SYS "OS_SpriteOp",12+256,sp%,"!Spr
ites"
  370 END
```

Listing 9 – FireWks

```
   10 REM >FireWks (Info9)
   20 REM by Richard Talbot-Watkins
   30 REM for 8-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 *FX 15,0
   70 KEY$=GET$
   80 ON ERROR MODE 7:END
   90 MODE 2
  100 VDU 23;8202;0;0;0;
  110 VDU 23;1,64,0;0;0;
  120 VDU 23;2,90,0;0;0;
  130 VDU 23;12,8,0;0;0;
  140 :
  150 PROCinit
  160 PROCassemble
  170 PROCscreen
  180 REPEAT
  190 !cx  = (RND(64)+31)*256
  200 !cy  = 255*256
  210 !cvx = RND(256)-128
  220 !cvy = -1024-RND(256)
  230 CALL start
  240 UNTIL FALSE
  250 END
  260 :
  270 DEF PROCinit
  280 num     = 160
  290 gravity = 13
  300 rate    = 6
  310 :
  320 scrtab% = &3000
  330 xlo%    = &3100
  340 xhi%    = &3200
  350 ylo%    = &3300
  360 yhi%    = &3400
  370 xvlo%   = &3500
  380 xvhi%   = &3600
  390 yvlo%   = &3700
  400 yvhi%   = &3800
  410 col%    = &3900
  420 rndtab% = &3A00
  430 code%   = &3B00
  440 :
  450 FOR N%=0 TO 255
  460 N%?scrtab% = &40+(N% DIV 8)*2
  470 N%?rndtab% = RND(256)
  480 NEXT
  490 ENDPROC
  500 :
  510 DEF PROCassemble
  520 x=&70
  530 y=&71
  540 col=&72
  550 read=&73
  560 write=&75
  570 cx=&77
  580 cy=&79
  590 cvx=&7B
  600 cvy=&7D
  610 rndptr=&7F
  620 count=&80
  630 storeX=&81
  640 phase=&82
  650 :
  660 FOR N%=0 TO 2 STEP 2
  670 P%=code%
  680 [OPT N%
  690 .plot
  700 STX storeX
  710 LDA x
  720 BMI offscreen
  730 AND #&FE
  740 STA write
  750 LDA #0
  760 ASL write
  770 ROL A
  780 ASL write
  790 ROL A
  800 CLC
  810 LDY y
  820 ADC scrtab%,Y
  830 STA write+1
  840 TYA
  850 AND #7
  860 TAY
  870 LDA x
  880 AND #1
  890 TAX
  900 LDA mask,X
  910 LDX col
  920 AND colours,X
  930 EOR (write),Y
  940 STA (write),Y
  950 .offscreen
  960 LDX storeX
  970 RTS
  980 .mask
  990 EQUW &55AA
 1000 .colours
 1010 EQUD &33033000
 1020 EQUD &3F0F3C0C
 1030 :
 1040 .rnd
 1050 LDY rndptr
 1060 LDA rndtab%,Y
 1070 EOR &FE44
 1080 STA rndtab%,Y
 1090 INC rndptr
 1100 RTS
 1110 :
 1120 .start
 1130 LDX #0
 1140 STX phase
 1150 TXA
 1160 .initdots
 1170 STA col%,X
 1180 INX
 1190 CPX #(num AND 255)
 1200 BNE initdots
 1210 :
 1220 .repeat
 1230 LDA #rate
 1240 STA count
 1250 LDX #0
 1260 .dotloop
 1270 LDA col%,X
 1280 BEQ nodot
 1290 LSR A
 1300 LSR A
 1310 STA col
 1320 CLC
 1330 LDA xlo%,X
 1340 ADC xvlo%,X
 1350 STA xlo%,X
 1360 LDA xhi%,X
 1370 STA x
 1380 ADC xvhi%,X
 1390 STA xhi%,X
 1400 CLC
 1410 LDA ylo%,X
 1420 ADC yvlo%,X
 1430 STA ylo%,X
 1440 LDA yhi%,X
 1450 STA y
 1460 ADC yvhi%,X
 1470 STA yhi%,X
 1480 CLC
 1490 LDA yvlo%,X
 1500 ADC #gravity
 1510 STA yvlo%,X
 1520 LDA yvhi%,X
 1530 ADC #0
 1540 STA yvhi%,X
 1550 JSR plot
 1560 DEC col%,X
 1570 BEQ donedot
 1580 LDA col%,X
 1590 LSR A
 1600 LSR A
 1610 STA col
 1620 LDA xhi%,X
 1630 STA x
 1640 LDA yhi%,X
 1650 CMP #4
 1660 BCC killdot
 1670 STA y
 1680 JSR plot
 1690 JMP donedot
 1700 .killdot
 1710 LDA #0
 1720 STA col%,X
 1730 BEQ donedot
 1740 :
 1750 .nodot
 1760 LDA count
 1770 BEQ donedot
 1780 DEC count
 1790 LDA cx
 1800 STA xlo%,X
 1810 LDA cx+1
 1820 STA xhi%,X
 1830 STA x
 1840 LDA cy
 1850 STA ylo%,X
 1860 LDA phase
 1870 BNE explode
 1880 JSR rnd
 1890 AND #3
 1900 CLC
 1910 ADC cy+1
 1920 STA yhi%,X
 1930 STA y
 1940 JSR rnd
 1950 AND #127
 1960 SEC
 1970 SBC #64
 1980 STA xvlo%,X
 1990 LDA #0
 2000 SBC #0
 2010 STA xvhi%,X
 2020 LDA #0
 2030 STA yvlo%,X
 2040 STA yvhi%,X
 2050 .showdot
 2060 JSR rnd
 2070 AND #7
 2080 CLC
 2090 ADC #24
 2100 STA col%,X
 2110 LSR A
 2120 LSR A
 2130 STA col
 2140 JSR plot
 2150 :
 2160 .donedot
 2170 INX
 2180 CPX #(num AND 255)
 2190 BEQ nextframe
 2200 JMP dotloop
 2210 :
 2220 .explode
 2230 CMP #224
 2240 BCS donedot
 2250 LDA cy+1
 2260 STA yhi%,X
 2270 STA y
 2280 JSR rnd
 2290 STA xvlo%,X
 2300 JSR rnd
 2310 STA yvlo%,X
 2320 JSR rnd
 2330 AND #1
 2340 SEC
 2350 SBC #1
 2360 STA xvhi%,X
 2370 JSR rnd
 2380 AND #3
 2390 SEC
 2400 SBC #3
 2410 STA yvhi%,X
 2420 JMP showdot
 2430 :
 2440 .nextframe
 2450 LDA phase
 2460 BNE exploding
 2470 CLC
 2480 LDA cx
 2490 ADC cvx
 2500 STA cx
 2510 LDA cx+1
 2520 ADC cvx+1
 2530 STA cx+1
 2540 CLC
 2550 LDA cy
 2560 ADC cvy
 2570 STA cy
 2580 LDA cy+1
 2590 ADC cvy+1
 2600 STA cy+1
 2610 CLC
 2620 LDA cvy
 2630 ADC #gravity
 2640 STA cvy
 2650 LDA cvy+1
 2660 ADC #0
 2670 STA cvy+1
 2680 BMI moved
 2690 JSR rnd
 2700 CMP #32
 2710 BCS moved
 2720 LDA #180
 2730 STA phase
 2740 BNE moved
 2750 .exploding
 2760 INC phase
 2770 BEQ exit
 2780 .moved
 2790 BIT &FF
 2800 BMI exit
 2810 JMP repeat
 2820 .exit
 2830 RTS
 2840 ]
 2850 NEXT
 2860 ENDPROC
 2870 :
 2880 DEF PROCscreen
 2890 LOCAL N%,M%,height%
 2900 height%=4
 2910 FOR N%=&7E00 TO &7FFF STEP 8
 2920 FOR M%=height% TO 7
 2930 M%?N%=&0C
 2940 NEXT
 2950 height%=height%+RND(3)-2
 2960 IF height%<0 height%=0
 2970 IF height%>7 height%=7
 2980 NEXT
 2990 ?col=7
 3000 FOR N%=1 TO 30
 3010 ?x=RND(128)-1
 3020 ?y=RND(248)-1
 3030 CALL plot
 3040 NEXT
 3050 ENDPROC
```

Listing 10 – Flag

```
   10 REM >Flag (Info10)
   20 REM by Morgan Henry
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 13
   70 PROCass
   80 PROCdomotion
   90 REPEAT
  100 CLS
  110 CALLflag
  120 WAIT
  130 UNTIL FALSE
  140 END
  150 :
  160 DEF PROCdomotion
  170 k=359/255
  180 FOR i%=0 TO 255
  190 a=i%*k
  200 x%=20*COSRAD(a*5)+15*SINRAD(a*2)+1
0*COSRAD(a*3)
  210 y%=20*SINRAD(a*3)+10*COSRAD(a)+10*
SINRAD(a*2)
  220 !(motion+i%*8)=x%
  230 !(motion+i%*8+4)=y%
  240 NEXT
  250 ENDPROC
  260 :
  270 DEF PROCass
  280 DIM code% 1000,motion 256*8
  290 FOR i%=0 TO 2 STEP 2
  300 P%=code%
  310 [OPT i%
  320 .flag   LDR     r10,screen
  330 MOV     r2,#&FF
  340 ADR     r5,motion
  350 LDR     r4,theta
  360 ADD     r4,r4,#1
  370 AND     r4,r4,#&FF
  380 STR     r4,theta
  390 MOV     r7,#50
  400 MOV     r9,#17
  410 .loop1  MOV     r6,#40
  420 MOV     r8,#24
  430 .loop2  ADD     r11,r4,r8,LSL #1
  440 ADD     r11,r11,r9,LSL #2
  450 AND     r11,r11,#&FF
  460 MOV     r11,r11,LSL #3
  470 LDR     r0,[r5,r11]
  480 ADD     r11,r11,#4
  490 LDR     r1,[r5,r11]
  500 ADD     r0,r0,r6
  510 ADD     r1,r1,r7
  520 ADD     r0,r0,r1,LSL #8
  530 ADD     r0,r0,r1,LSL #6
  540 STRB    r2,[r10,r0]
  550 ADD     r6,r6,#10
  560 SUBS    r8,r8,#1
  570 BNE     loop2
  580 ADD     r7,r7,#10
  590 SUBS    r9,r9,#1
  600 BNE     loop1
  610 MOV     r15,r14
  620
  630 .theta  EQUD    0
  640 .screen EQUD    148
  650 EQUD    -1
  660 ]
  670 NEXT
  680 SYS "OS_ReadVduVariables",screen,s
creen
  690 ENDPROC
```

Listing 11 – Register

```
   10 REM >Register (Info11)
   20 REM by Dave Lawrence
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 DIM block 64
   70 PROCcode
   80 REPEAT
   90 INPUT "Register :"path$
  100 IF path$<>"" THEN
  110 file$=""
  120 i=LENpath$
  130 REPEAT
  140 file$=RIGHT$(path$,1)+file$
  150 path$=LEFT$(path$)
  160 UNTIL RIGHT$(path$,1)="." OR path$
=""
```

```
  170 IF path$="" path$="@" ELSE path$=L
EFT$(path$)
  180 INPUT "Store in :"dest$
  190 IF dest$="" THEN
  200 dest$="$"
  210 ELSE
  220 dest$="$."+dest$
  230 ENDIF
  240 PROCregister(file$,path$,dest$)
  250 ENDIF
  260 UNTIL path$=""
  270 SYS "OS_File",10,"RFSmod",&FFA,,co
de,0%
  280 END
  290 :
  300 DEF PROCregister(file$,path$,dest$
)
  310 SYS "OS_File",5,path$+"."+file$ TO
 type
  320 IF type=0 THEN
  330 PRINT"Not found"
  340 ELSE
  350 IF type=1 THEN
  360 PROCstore(path$+"."+file$,dest$+".
"+file$)
  370 ELSE
  380 PROCdirectory(path$+"."+file$,dest
$+"."+file$)
  390 ENDIF
  400 ENDIF
  410 ENDPROC
  420 :
  430 DEF PROCdirectory(a$,b$)
  440 LOCAL ptr
  450 ptr=0
  460 REPEAT
  470 SYS "OS_GBPB",9,a$,block,1,ptr,64
TO ,,,read,ptr
  480 IF read=1 THEN
  490 f$=""
  500 i=0
  510 REPEAT
  520 f$+=CHR$(block?i)
  530 i+=1
  540 UNTIL block?i=0
  550 PROCregister(f$,a$,b$)
  560 ENDIF
  570 UNTIL ptr=-1
  580 ENDPROC
  590 :
  600 DEF PROCcode
  610 space=HIMEM-END-32*1024
  620 DIM code space
  630 wp=12:sp=13:link=14:pc=15
  640 FOR pass=4 TO 6 STEP 2:P%=0:O%=cod
e
  650 [OPT pass
  660 EQUD    0
  670 EQUD    Init_Code
  680 EQUD    Final_Code
  690 EQUD    0
  700 EQUD    Title_String
  710 EQUD    Help_String
  720 EQUD    0
  730 EQUD    0
  740 EQUD    0
  750 EQUD    0
  760 EQUD    0
  770 .Title_String
  780 EQUS    "ResourceFiles"
  790 EQUB    0
  800 .Help_String
  810 EQUS    "Resource Files"
  820 EQUB    9
  830 EQUS    "1.00 (28 Jul 1992)"
  840 EQUB    0
  850 ALIGN
  860 .Init_Code
  870 STMFD   (sp)!,{R0,link}
  880 ADR     R0,Files
  890 SWI     "XResourceFS_RegisterFiles
"
  900 LDMFD   (sp)!,{R0,pc}
  910 .Final_Code
  920 STMFD   (sp)!,{R0,link}
  930 ADR     R0,Files
  940 SWI     "XResourceFS_DeregisterFil
es"
  950 LDMFD   (sp)!,{R0,pc}
  960 .Files  EQUD    0
  970 ]NEXT
  980 ENDPROC
  990 :
 1000 DEF PROCstore(source$,as$)
 1010 PRINTsource$;" -> ";as$
 1020 SYS "OS_File",5,source$ TO ,,load,
exec,size,attr
 1030 [OPT 4
 1040 .offset
 1050 EQUD    load
 1060 EQUD    exec
 1070 EQUD    size
 1080 EQUD    attr
 1090 EQUS    MID$(as$,3)
 1100 EQUB    0
 1110 ALIGN
 1120 EQUD    size+4
 1130 FNload(source$)
 1140 ALIGN
 1150 .next   EQUD    0
 1160 ]
 1170 !(code+offset-4)=next-offset+4
 1180 ENDPROC
 1190 :
 1200 DEF FNload(f$)
 1210 SYS "OS_File",&FF,f$,0% TO ,,,,len
 1220 P%+=len:O%+=len
 1230 =""
```

Listing 12 – ColDemo1

```
   10 REM >ColDemo1 (Info12)
   20 REM by Bryan Creer
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 13
   70 OFF
   80 ORIGIN 240,128
   90 FOR n%=0 TO 3
  100 FOR m%=0 TO 3
  110 COLOUR n%*4+m%,0,m%*16,(2*n%+m% MO
D 2)*16
  120 NEXT
  130 NEXT
  140 GCOL 40
  150 RECTANGLE FILL -240,-128,1280,1024
  160 unit%=52
  170 FOR n%=0 TO 7
  180 FOR m%=0 TO 7
  190 GCOL (n% DIV 2)*16+(m% DIV 2)*4+n%
 MOD 2 TINT ((m% MOD 2)*2)*64
  200 MOVE m%*unit%*2,n%*unit%*2-unit%+4
  210 MOVE m%*unit%*2-unit%+4,n%*unit%*2
  220 PLOT &55,m%*unit%*2+unit%-4,n%*uni
t%*2
  230 MOVE m%*unit%*2,n%*unit%*2+unit%
  240 MOVE m%*unit%*2-unit%+4,n%*unit%*2
+4
  250 PLOT &55,m%*unit%*2+unit%-4,n%*uni
t%*2+4
  260 GCOL (n% DIV 2)*16+(m% DIV 2)*4+n%
 MOD 2 TINT ((m% MOD 2)*2+1)*64
  270 MOVE m%*unit%*2+unit%,n%*unit%*2+4
  280 MOVE m%*unit%*2+4,n%*unit%*2+unit%
  290 PLOT &55,m%*unit%*2+unit%*2-4,n%*u
nit%*2+unit%
  300 MOVE m%*unit%*2+unit%,n%*unit%*2+u
nit%*2
  310 MOVE m%*unit%*2+4,n%*unit%*2+unit%
+4
  320 PLOT &55,m%*unit%*2+unit%*2-4,n%*u
nit%*2+unit%+4
  330 NEXT
  340 NEXT
  350 g$=GET$
  360 CLS
  370 END
```

Listing 13 – ColDemo2

```
   10 REM >ColDemo2 (Info13)
   20 REM by Bryan Creer
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 13
   70 OFF
   80 ORIGIN 240,128
   90 FOR n%=0 TO 3
  100 FOR m%=0 TO 3
  110 COLOUR n%*4+m%,(2*n%+m% MOD 2)*16,
m%*16,0
  120 NEXT
  130 NEXT
  140 GCOL 40
  150 RECTANGLE FILL -240,-128,1280,1024
  160 unit%=52
  170 FOR n%=0 TO 7
  180 FOR m%=0 TO 7
  190 GCOL ((n% DIV 2) MOD 2)*16+(m% DIV
 2)*4+(n% DIV 4)*2+(n% MOD 2) TINT ((m%
MOD 2)*2)*64
  200 MOVE m%*unit%*2,n%*unit%*2-unit%+4
  210 MOVE m%*unit%*2-unit%+4,n%*unit%*2
  220 PLOT &55,m%*unit%*2+unit%-4,n%*uni
t%*2
  230 MOVE m%*unit%*2,n%*unit%*2+unit%
  240 MOVE m%*unit%*2-unit%+4,n%*unit%*2
+4
  250 PLOT &55,m%*unit%*2+unit%-4,n%*uni
t%*2+4
  260 GCOL ((n% DIV 2) MOD 2)*16+(m% DIV
 2)*4+(n% DIV 4)*2+(n% MOD 2) TINT ((m%
MOD 2)*2+1)*64
  270 MOVE m%*unit%*2+unit%,n%*unit%*2+4
  280 MOVE m%*unit%*2+4,n%*unit%*2+unit%
  290 PLOT &55,m%*unit%*2+unit%*2-4,n%*u
nit%*2+unit%
  300 MOVE m%*unit%*2+unit%,n%*unit%*2+u
nit%*2
  310 MOVE m%*unit%*2+4,n%*unit%*2+unit%
+4
  320 PLOT &55,m%*unit%*2+unit%*2-4,n%*u
nit%*2+unit%+4
  330 NEXT
  340 NEXT
  350 g$=GET$
  360 CLS
  370 END
```

Listing 14 – ColDemo3

```
   10 REM >ColDemo3 (Info14)
   20 REM by Bryan Creer
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 13
   70 OFF
   80 ORIGIN 640,0
   90 FOR n%=0 TO 7
  100 COLOUR n%,16*n%,16*(3-(n% MOD 4)),
0
  110 NEXT
  120 FOR n%=0 TO 7
  130 COLOUR n%+8,0,16*(3-(n% MOD 4)),16
*n%
  140 NEXT
  150 :
  160 FOR n%=15 TO 0 STEP -1
  170 r%=n% DIV 4
  180 g%=3-n% DIV 4
  190 t%=n% MOD 4
  200 GCOL (g%*4)+r% TINT t%*64
  210 RECTANGLE FILL -(n%+1)*40,0,40,102
4
  220 NEXT
  230 :
  240 FOR n%=0 TO 15
  250 b%=(n% DIV 8)*2+1
  260 g%=3-n% DIV 4
  270 r%=(n% AND 4) DIV 4
  280 t%=n% MOD 4
  290 GCOL (b%*16)+(g%*4)+r% TINT t%*64
  300 RECTANGLE FILL n%*40,0,40,1024
  310 NEXT
  320 g$=GET$
  330 ON
  340 END
```

Listing 15 – ColDemo4

```
   10 REM >ColDemo4 (Info15)
   20 REM by Bryan Creer
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 13
   70 OFF
   80 ORIGIN 640,0
   90  FOR n%=0 TO 7
  100  COLOUR n%,16*n%,16*(3-(n% MOD 4))
,16*15
  110 NEXT
  120 FOR n%=0 TO 7
  130   COLOUR n%+8,16*15,16*(3-(n% MOD
4)),16*n%
  140 NEXT
  150 :
  160 FOR n%=0 TO 15
  170  b%=2
  180  r%=n% DIV 4
  190  g%=3-n% DIV 4
  200  t%=n% MOD 4
  210  GCOL (b%*16)+(g%*4)+r% TINT t%*64
  220  RECTANGLE FILL (n%-16)*40,0,40,10
24
  230 NEXT
  240 :
  250 FOR n%=15 TO 0 STEP -1
  260  b%=(n% DIV 8)*2+1
  270  g%=3-n% DIV 4
  280  r%=2+(n% AND 4) DIV 4
  290  t%=n% MOD 4
  300  GCOL (b%*16)+(g%*4)+r% TINT t%*64
  310  RECTANGLE FILL (15-n%)*40,0,40,10
24
  320 NEXT
  330 g$=GET$
  340 ON
  350 END
```

Listing 16 – ProcDem

```
   10 REM >ProcDem (Info16)
   20 REM by DCA
   30 REM for 32-bit machines
   40 REM (c) BAU November 1992
   50 :
   60 MODE 0
   70 max%=5
   80 DIM a$(max%-1)
   90 s$="This is a short demonstration
of RETURN parameters."
  100 PRINT"String: "s$'
  110 PROCanalyse(s$,a$(),max%,n%)
  120 IF n%>0 THEN
  130  FOR i%=0 TO n%-1
  140   PRINT;i%;": ";a$(i%)
  150  NEXT
  160 ENDIF
  170 PRINT'"Remainder: ";s$
  180 END
  190 :
  200 DEF PROCanalyse(RETURN orig$,RETUR
N par$(),max%,RETURN no%)
  210 LOCAL i%
  220 no%=0
  230 WHILE orig$<>"" AND no%<max%
  240  WHILE LEFT$(orig$,1)=" "
  250   orig$=MID$(orig$,2)
  260  ENDWHILE
  270  IF orig$<>"" THEN
  280   i%=INSTR(orig$," ")
  290   IF i%=0 i%=LEN(orig$)+1
  300   par$(no%)=LEFT$(orig$,i%-1)
  310   orig$=MID$(orig$,i%+1)
  320   no%+=1
  330  ENDIF
  340 ENDWHILE
  350 ENDPROC
```

LOOK AND LEARN

Listing 1 – !RunImage

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   10 REM >!RunImage (DeskLearn1)
   20 REM DeskLearn
   30 REM by Dave Acton
   40 REM for 32-bit machines
   50 REM (c) BAU November 1992
   60 :
   70 DIM q% &1000,temp% &100,ic% 64,men
ubuf% &800
   80 $q%="TASK"
   90 SYS "Wimp_Initialise",200,!q%,"Des
kLearn" TO version%,mytask%
  100 ON ERROR PROCwarn("DeskLearn has s
uffered a fatal error ("+REPORT$+" at li
ne "+STR$ERL+") and must exit"):SYS "Wim
p_CloseDown":END
  110 PROCinit
  120 baricon%=FNicon_bar("desklearn")
  130 done%=FALSE
  140 REPEAT
  150 t=next_time
  160 IF flash_time<t t=flash_time
  170 IF animate THEN IF anim_time<t t=a
nim_time
  180 SYS "Wimp_PollIdle",,q%,t TO reaso
n%
  190 CASE reason% OF
  200 WHEN 0:PROCidle
  210 WHEN 1:PROCredraw
  220 WHEN 2:SYS "Wimp_OpenWindow",,q%
  230 WHEN 3:PROCclose(!q%)
  240 WHEN 6:PROCmouse(!q%,q%!4,q%!8,q%!
12,q%!16)
  250 WHEN 9:PROCmenu_select
  260 WHEN 17,18:IF q%!16=0 done%=TRUE
  270 ENDCASE
  280 UNTIL done%
  290 PROCsave_current
  300 SYS "Wimp_CloseDown"
  310 END
  320 :
  330 DEF PROCinit
  340 DIM subject% &100,subst_out% &100,
ind% &100,string% &100
  350 ind_end%=ind%+&100
  360 max_q%=100
  370 max_f%=100
  380 max_subj%=100
  390 DIM q$(max_q%),a$(max_q%,3),ans%(m
ax_q%),time%(max_q%),asked%(max_q%),reco
rd%(max_q%)
  400 DIM qtype%(max_q%),right%(max_q%),
pool$(max_q%)
  410 DIM f$(max_f%),ftype%(max_f%),fq%(
max_f%)
  420 DIM choice$(3),correct%(3),int%(5)
,macro$(9)
  430 DIM subj_use%(max_subj%),subj_vali
d%(max_subj%),subj$(max_subj%),subj_m%(m
ax_subj%)
  440 cur_subj%=-1
  450 int%()=0,1,3,5,10,20
  460 cur_int%=2
  470 rec_record%=0
  480 rec_right%=0
  490 rec_asked%=0
  500 stats%=FALSE
  510 stat_waiting%=0
  520 stat_asking%=1
  530 stat_picked%=2
  540 stat_reveal%=3
  550 stat_right%=4
  560 stat_wrong%=5
  570 stat_next%=6
  580 stat_idle%=7
  590 stat_hide%=8
  600 status%=stat_idle%
  610 flash_status%=stat_idle%
  620 SYS "XOS_File",5,"<DeskLearn$Dir>.
Anim" TO animate,,,,anim_len%
  630 animate=(animate=1)
  640 IF animate PROCanimate_init
  650 menuptr%=menubuf%
  660 SYS "Wimp_OpenTemplate",,"<DeskLea
rn$Dir>.Templates"
  670 SYS "Wimp_LoadTemplate",,temp%,,,-
1,"blank"
  680 $(temp%+72)="Statistics"
  690 temp%?31=%10000111
  700 SYS "Wimp_CreateWindow",,temp% TO
s_hand%
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710 temp%?31=%10000101
720 temp%!56=(temp%!56) OR (1<<8)
730 IF animate THEN temp%!64=anim_sprites% ELSE temp%!64=1
740 temp%!68=1
750 temp%!72=subject%
760 temp%!76=0
770 temp%!80=-1
780 SYS "Wimp_CreateWindow",,temp% TO q_hand%
790 SYS "Wimp_CreateWindow",,temp% TO f_hand%
800 SYS "Wimp_LoadTemplate",,q%,ind%,ind_end%,-1,"progInfo"
810 SYS "Wimp_CreateWindow",,q% TO info_hand%
820 SYS "Wimp_CloseTemplate"
830 PROCset_ext(s_hand%,35*16,10*40)
840 subjects%=0
850 subj_menu%=FNget_subj("<DeskLearn$Dir>.Subjects","")
860 IF subj_menu%=-1 ERROR 0,"No question files"
870 FOR i%=0 TO subjects%-1
880 subj_valid%(i%)=FNtry_load(i%,err$)
890 IF NOT subj_valid%(i%) THEN
900 PROCwarn("Cannot use question file """+subj$(i%)+""" - "+err$)
910 ENDIF
920 NEXT
930 cur_subj%=-1
940 int_menu%=FNmake_men("None,1 min,3 mins,5 mins,10 mins,20 mins","Interval")
950 dir_menu%=FNmake_men("Text,Data","Open")
960 quit_menu%=FNmake_men("Info,Subject,Interval,Stats,Open Dir,Quit","DeskLearn")
970 PROCattach_sub_menu(subj_menu%,quit_menu%,1)
980 PROCattach_sub_menu(int_menu%,quit_menu%,2)
990 PROCattach_sub_menu(dir_menu%,quit_menu%,4)
1000 PROCattach_sub_menu(info_hand%,quit_menu%,0)
1010 ENDPROC
1020 :
1030 DEF FNget_subj(dir$,sub$)
1040 LOCAL menu%,n%,r%,m$,sub%,s$,pass%
1050 m$=""
1060 n%=0
1070 REPEAT
1080 SYS "OS_GBPB",10,dir$+sub$,temp%,1,n%,&100,"*" TO ,,,r%,n%
1090 IF r%=1 AND n%>=0 m$=m$+FNget_str(temp%+20)+","
1100 UNTIL n%=-1
1110 IF m$="" THEN =-1
1120 menu%=FNmake_men(LEFT$(m$),FNlast_bit(dir$+sub$))
1130 n%=0
1140 REPEAT
1150 SYS "OS_GBPB",10,dir$+sub$,temp%,1,n%,&100,"*" TO ,,,r%,n%
1160 IF r%=1 AND n%>=0 THEN
1170 IF temp%!16=1 THEN
1180 IF subjects%<max_subj% THEN
1190 s$=sub$+"."+FNget_str(temp%+20)
1200 IF LEFT$(s$,1)="." s$=MID$(s$,2)
1210 subj$(subjects%)=s$
1220 subj_m%(subjects%)=menu%+28+24*(n%-1)
1230 subjects%+=1
1240 ELSE
1250 PROCfade(menu%,n%)
1260 ENDIF
1270 ELSE
1280 s$=FNget_str(temp%+20)
1290 sub%=FNget_subj(dir$,sub$+"."+s$)
1300 IF sub%=-1 THEN
1310 PROCfade(menu%,n%-1)
1320 ELSE
1330 PROCattach_sub_menu(sub%,menu%,n%-1)
1340 ENDIF
1350 ENDIF
1360 ENDIF
1370 UNTIL n%=-1
1380 =menu%
1390 :
1400 DEF FNlast_bit(s$)
1410 WHILE INSTR(s$,".")>0
1420 s$=MID$(s$,INSTR(s$,".")+1)
1430 ENDWHILE
1440 =s$
1450 :
1460 DEF FNget_str(a%)
1470 LOCAL a$
1480 WHILE ?a%>=32
1490 a$=a$+CHR$?a%
1500 a%+=1
1510 ENDWHILE
1520 =a$
1530 :
1540 DEF PROCidle
1550 IF animate PROCanimate
1560 IF FNtime>flash_time PROCflash
1570 IF FNtime>next_time PROCquest
1580 ENDPROC
1590 :
1600 DEF PROCflash
1610 CASE flash_status% OF
1620 WHEN stat_waiting%:
1630 IF flash%=0 OR cur_subj%=-1 THEN
1640 flash_status%=stat_idle%
1650 ELSE
1660 flash_status%=stat_hide%
1670 IF flash%=1 i%=0 ELSE i%=RND(flash%)-1
1680 IF ftype%(i%)=-1 THEN
1690 flash$=f$(i%)
1700 ELSE
1710 IF f$(i%)<>"" THEN
1720 flash$=FNsubst(f$(i%),macro$(ftype%(i%)))
1730 ELSE
1740 IF fq%(i%)<>-1 THEN flash$=FNsubst(q$(fq%(i%))+","+a$(fq%(i%),0),macro$(ftype%(i%)))
1750 ENDIF
1760 ENDIF
1770 flash_time=FNtime+7*LEN(flash$)
1780 flash_lines%=FNsplit(flash$,30,FALSE,0,0)
1790 PROCset_ext(f_hand%,32+16*30,40*(flash_lines%+2))
1800 PROCopen_in_centre(f_hand%)
1810 ENDIF
1820 WHEN stat_hide%:
1830 PROCclose(f_hand%)
1840 flash_time=FNtime+int%(cur_int%)*6000*(RND(1)+0.5)
1850 IF flash_time<FNtime+2000 flash_time=FNtime+2000
1860 flash_status%=stat_waiting%
1870 WHEN stat_idle%:
1880 flash_time=FNtime+100
1890 IF flash%>0 flash_status%=stat_waiting%
1900 ENDCASE
1910 ENDPROC
1920 :
1930 DEF PROCquest
1940 CASE status% OF
1950 WHEN stat_idle%
1960 IF SUM subj_use%()<>0 THEN PROCset_next ELSE next_time=FNtime+100
1970 WHEN stat_waiting%:
1980 IF SUM subj_use%()=0 THEN
1990 status%=stat_idle%
2000 ELSE
2010 IF RND>0 j%=1 ELSE j%=subjects%-1
2020 i%=RND(subjects%)-1
2030 REPEAT
2040 i%=(i%+j%) MOD subjects%
2050 UNTIL subj_use%(i%) AND subj_valid%(i%)
2060 IF cur_subj%<>i% THEN
2070 PROCsave_current
2080 PROCload(i%)
2090 ENDIF
2100 IF qno% MOD 2=0 THEN
2110 comp$="FNolder"
2120 j%=0
2130 ELSE
2140 comp$="FNharder"
2150 j%=-1
2160 REPEAT
2170 j%+=1
2180 UNTIL time%(j%)<qno%-min_qno%
2190 ENDIF
2200 FOR i%=0 TO quest%-1
2210 IF EVAL(comp$)>0 j%=i%
2220 NEXT
2230 i%=RND(quest%)-1
2240 w%=i%
2250 IF RND>0 k%=1 ELSE k%=quest%-1
2260 REPEAT
2270 i%=(i%+k%) MOD quest%
2280 UNTIL EVAL(comp$)=0 OR i%=w%
2290 curq%=i%
2300 IF qtype%(curq%)>=0 quest$=FNsubst(q$(curq%),macro$(qtype%(curq%))) ELSE quest$=q$(curq%)
2310 IF ans%(curq%)>1 THEN
2320 choices%=ans%(curq%)
2330 FOR i%=0 TO choices%-1
2340 choice$(i%)=a$(curq%,i%)
2350 NEXT
2360 ELSE
2370 pool%=0
2380 FOR i%=0 TO quest%-1
2390 IF i%<>curq% AND qtype%(i%)=qtype%(curq%) AND ans%(i%)=1 THEN
2400 pool$(pool%)=a$(i%,0)
2410 pool%+=1
2420 ENDIF
2430 NEXT
2440 choice$(0)=a$(curq%,0)
2450 choices%=1
2460 left%=pool%
2470 WHILE choices%<4 AND left%>0
2480 REPEAT
2490 r%=RND(pool%)-1
2500 UNTIL pool$(r%)<>""
2510 choice$(choices%)=pool$(r%)
2520 pool$(r%)=""
2530 left%-=1
2540 choices%+=1
2550 ENDWHILE
2560 ENDIF
2570 correct%()=FALSE
2580 correct%(0)=TRUE
2590 FOR i%=1 TO 10
2600 a%=RND(choices%)-1
2610 b%=RND(choices%)-1
2620 SWAP choice$(a%),choice$(b%)
2630 SWAP correct%(a%),correct%(b%)
2640 NEXT
2650 qwidth%=30
2660 FOR i%=0 TO choices%-1
2670 choice$(i%)=CHR$(i%+65)+". "+choice$(i%)
2680 IF animate THEN choice$(i%)=" "+choice$(i%)
2690 IF LEN(choice$(i%))>qwidth% qwidth%=LEN(choice$(i%))
2700 NEXT
2710 lines%=FNsplit(quest$,qwidth%,FALSE,0,0)
2720 PROCset_ext(q_hand%,32+16*qwidth%,40*(5+lines%+choices%))
2730 PROCreopen(q_hand%)
2740 status%=stat_asking%
2750 PROCupdate_stats
2760 ENDIF
2770 WHEN stat_asking%:next_time=FNtime+100
2780 WHEN stat_picked%:
2790 IF correct%(pick%) status%=stat_right% ELSE status%=stat_wrong%
2800 next_time=FNtime+300
2810 PROCupdate
2820 WHEN stat_right%,stat_reveal%:
2830 PROCanalyse
2840 curq%=-1
2850 PROCset_next
2860 !q%=q_hand%
2870 SYS "Wimp_CloseWindow",,q%
2880 PROCupdate_stats
2890 WHEN stat_wrong%
2900 next_time=FNtime+400
2910 status%=stat_reveal%
2920 PROCupdate
2930 ENDCASE
2940 ENDPROC
2950 :
2960 DEF FNolder=SGN(time%(j%)-time%(i%))
2970 :
2980 DEF FNharder
2990 IF time%(i%)>=qno%-min_qno% THEN =-1
3000 IF FNscore(i%)<>FNscore(j%) THEN =SGN(FNscore(j%)-FNscore(i%)) ELSE =FNolder
3010 :
3020 DEF PROCset_next
3030 next_time=FNtime+int%(cur_int%)*6000*(RND(1)+0.5)
3040 status%=stat_waiting%
3050 ENDPROC
3060 :
3070 DEF PROCanalyse
3080 PROCrecord(rec_record%,rec_right%,rec_asked%,correct%(pick%))
3090 PROCrecord(record%(curq%),right%(curq%),asked%(curq%),correct%(pick%))
3100 PROCrecord(subj_record%,subj_right%,subj_asked%,correct%(pick%))
3110 time%(curq%)=qno%+RND(5)-3
3120 IF (record%(curq%) AND 15)=15 time%(curq%)+=quest%/8
3130 qno%+=1
3140 ENDPROC
3150 :
3160 DEF PROCrecord(RETURN r%,RETURN n%,RETURN d%,c%)
3170 IF (r% AND (1<<31))<>0 n%-=1
3180 r%=r%<<1
3190 IF c% THEN r%=r% OR 1:n%+=1
3200 IF d%<32 d%+=1
3210 ENDPROC
3220 :
3230 DEF PROCmouse(mx%,my%,mb%,mw%,mi%)
3240 CASE mw% OF
3250 WHEN -2:
3260 CASE TRUE OF
3270 WHEN (mb% AND 2)>0:PROCopen_menu(quit_menu%,mx%-64,362)
3280 WHEN (mb% AND 4)>0:IF status%=stat_idle% OR status%=stat_waiting% THEN status%=stat_waiting%:next_time=FNtime
3290 WHEN (mb% AND 1)>0:IF flash_status%=stat_idle% OR flash_status%=stat_waiting% THEN flash_status%=stat_waiting%:flash_time=FNtime
3300 ENDCASE
3310 WHEN q_hand%:
3320 IF (mb% AND 5)>0 THEN
3330 !q%=mw%
3340 SYS "Wimp_GetWindowState",,q%
3350 ax0%=q%!4-q%!20
3360 ay0%=q%!16-q%!24
3370 IF status%=stat_asking% THEN
3380 y%=(ay0%-my%-40*(lines%+2)+4)
3390 pick%=y% DIV 40
3400 IF pick%>=0 AND pick%<=choices%-1 AND y%>=0 THEN
3410 status%=stat_picked%
3420 next_time=FNtime+75
3430 PROCupdate
3440 ENDIF
3450 ENDIF
3460 ENDIF
3470 ENDCASE
3480 ENDPROC
3490 :
3500 DEF PROCupdate
3510 SYS "Wimp_ForceRedraw",q_hand%,0,-40*(lines%+5+choices%),32+16*qwidth%,0
3520 ENDPROC
3530 :
3540 DEF PROCupdate_stats
3550 IF stats% SYS "Wimp_ForceRedraw",s_hand%,0,-10*40,35*16,0
3560 ENDPROC
3570 :
3580 DEF PROCredraw
3590 LOCAL i%,more%,hand%
3600 hand%=!q%
3610 SYS "Wimp_RedrawWindow",,q% TO more%
3620 WHILE more%
3630 ax0%=q%!4-q%!20
3640 ay0%=q%!16-q%!24
3650 CASE hand% OF
3660 WHEN s_hand%:
3670 PROCborder(ax0%,ay0%,1,1,33,2)
3680 PROCborder(ax0%,ay0%,1,4,33,5)
3690 PROCborder(ax0%,ay0%,1,7,33,8)
3700 SYS "Wimp_SetColour",7
3710 MOVE ax0%+16,ay0%-40
3720 PRINT"Recent answers"
3730 MOVE ax0%+16,ay0%-4*40
3740 PRINT"Current subject"
3750 MOVE ax0%+16,ay0%-7*40
3760 PRINT"Current question"
3770 PROCshow_bar(ax0%,ay0%-100,rec_asked%,rec_record%,rec_right%)
3780 IF curq%<>-1 THEN PROCshow_bar(ax0%,ay0%-340,asked%(curq%),record%(curq%),right%(curq%))
3790 IF cur_subj%<>-1 PROCshow_bar(ax0%,ay0%-220,subj_asked%,subj_record%,subj_right%)
3800 WHEN f_hand%
3810 z%=FNsplit(flash$,30,TRUE,ax0%+16,ay0%-40)
3820 PROCborder(ax0%,ay0%,1,1,30,flash_lines%)
3830 WHEN q_hand%:
3840 z%=FNsplit(quest$,qwidth%,TRUE,ax0%+16,ay0%-40)
3850 PROCborder(ax0%,ay0%,1,1,qwidth%,lines%)
3860 SYS "Wimp_SetColour",7
3870 FOR i%=0 TO choices%-1
3880 col%=6
3890 CASE status% OF
3900 WHEN stat_picked%,stat_right%,stat_wrong%:IF i%=pick% col%=7 ELSE col%=4
3910 WHEN stat_reveal%:IF correct%(i%) col%=11 ELSE col%=4
3920 ENDCASE
3930 SYS "Wimp_SetColour",col%
3940 MOVE ax0%+16,ay0%-40*(lines%+2+i%)
3950 PRINT choice$(i%)
3960 NEXT
3970 CASE status% OF
3980 WHEN stat_asking%:mess$="Please choose: A-"+CHR$(64+choices%)
3990 WHEN stat_right%:mess$="Yes, that is correct!"
4000 WHEN stat_wrong%:mess$="Sorry, that's incorrect"
4010 WHEN stat_reveal%:mess$="This is the right answer"
4020 OTHERWISE
4030 mess$=""
4040 ENDCASE
4050 MOVE ax0%+16+8*(qwidth%-LEN(mess$)),ay0%-40*(lines%+choices%+3)
4060 SYS "Wimp_SetColour",7
4070 PRINT mess$
4080 PROCborder(ax0%,ay0%,1,lines%+choices%+3,qwidth%,lines%+choices%+3)
4090 IF animate PROCanim_show
4100 ENDCASE
4110 SYS "Wimp_GetRectangle",,q% TO more%
4120 ENDWHILE
4130 ENDPROC
4140 :
4150 DEF PROCshow_bar(x%,y%,asked%,record%,right%)
4160 LOCAL i%,col%
4170 FOR i%=0 TO 31
4180 IF i%>=asked% THEN
4190 col%=3
4200 ELSE
4210 IF (record% AND (1<<i%))<>0 col%=10 ELSE col%=11
4220 ENDIF
4230 SYS "Wimp_SetColour",col%
4240 RECTANGLE FILL x%+4+16*(32-i%),y%,12,12
4250 NEXT
4260 SYS "Wimp_SetColour",7
4270 IF asked%>0 THEN
4280 MOVE x%+16*20,y%+60
4290 PRINT RIGHT$("  "+STR$(INT(100*right%/asked%)),3)"%"
4300 ENDIF
4310 ENDPROC
4320 :
4330 DEF PROCborder(ax0%,ay0%,x0%,y0%,x1%,y1%)
4340 x0%=ax0%+16*x0%-12+4
4350 y0%=ay0%-40*y0%+12
4360 x1%=ax0%+16*x1%+12+4
4370 y1%=ay0%-40*(y1%+1)-4
4380 PROCedge(0,x1%,y0%,x1%-2,y0%-4,x1%,y1%,x1%-2,y1%+4)
4390 PROCedge(0,x0%,y1%,x0%,y1%,x1%,y1%,x1%,y1%+4)
4400 PROCedge(4,x0%,y0%,x0%+2,y0%-4,x0%
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,y1%,x0%+2,y1%+4)
 4410 PROCedge(4,x0%,y0%,x0%,y0%,x1%,y0%
,x1%,y0%)
 4420 ENDPROC
 4430 :
 4440 DEF PROCedge(c%,x0%,y0%,x1%,y1%,x2
%,y2%,x3%,y3%)
 4450 SYS "Wimp_SetColour",c%
 4460 IF x0%=x1% LINE x0%,y0%,x2%,y2% EL
SE MOVE x0%,y0%:MOVE x1%,y1%:PLOT 85,x2%
,y2%:PLOT 85,x3%,y3%
 4470 ENDPROC
 4480 :
 4490 DEF FNcx=((FNmv(MODE,11)+1)<<FNmv(
MODE,4)) DIV 2
 4500 DEF FNcy=((FNmv(MODE,12)+1)<<FNmv(
MODE,5)) DIV 2
 4510 :
 4520 DEF FNmv(mode%,var%)
 4530 LOCAL v%
 4540 SYS "OS_ReadModeVariable",mode%,va
r% TO ,,v%
 4550 =v%
 4560 :
 4570 DEF FNicon_bar(name$)
 4580 LOCAL ii%
 4590 !ic%=-1:ic%!4=0:ic%!8=0:ic%!12=68:
ic%!16=68
 4600 ic%!20=&7000311A
 4610 DIM ic%!24 12
 4620 $(ic%!24)="!"+name$
 4630 ic%!28=1
 4640 ic%!32=12
 4650 SYS "Wimp_CreateIcon",,ic% TO ii%
 4660 =ii%
 4670 :
 4680 DEF PROCset_ext(hand%,width%,heigh
t%)
 4690 q%!0=0
 4700 q%!4=-height%
 4710 q%!8=width%
 4720 q%!12=0
 4730 SYS "Wimp_SetExtent",hand%,q%
 4740 ENDPROC
 4750 :
 4760 DEF PROCreopen(hand%)
 4770 !q%=hand%
 4780 SYS "Wimp_GetWindowInfo",,q%
 4790 width%=q%!52-q%!44
 4800 height%=q%!56-q%!48
 4810 q%!12=q%!4+width%
 4820 q%!8=q%!16-height%
 4830 q%!20=0
 4840 q%!24=0
 4850 q%!28=-1
 4860 SYS "Wimp_OpenWindow",,q%
 4870 ENDPROC
 4880 :
 4890 DEF PROCopen_in_centre(hand%)
 4900 LOCAL width%,height%
 4910 !q%=hand%
 4920 SYS "Wimp_GetWindowInfo",,q%
 4930 width%=q%!52-q%!44
 4940 height%=q%!56-q%!48
 4950 q%!4=FNcx-width%/2
 4960 q%!8=FNcy-height%/2
 4970 q%!12=FNcx+width%/2
 4980 q%!16=FNcy+height%/2
 4990 q%!20=0
 5000 q%!24=0
 5010 q%!28=-1
 5020 SYS "Wimp_OpenWindow",,q%
 5030 ENDPROC
 5040 :
 5050 DEF FNscore(i%)
 5060 IF asked%(i%)=0 THEN =100 ELSE =IN
T(100*right%(i%)/asked%(i%))
 5070 :
 5080 DEF PROCsave_current
 5090 LOCAL i%,j%,data$
 5100 IF cur_subj%=-1 ENDPROC
 5110 data$="<DeskLearn$Dir>.data."+subj
$(cur_subj%)
 5120 SYS "XOS_File",5,data$ TO i%
 5130 IF i%<>1 SYS "OS_FSControl",26,"<D
eskLearn$Dir>.Subjects","<DeskLearn$Dir>
.data",%10000000011
 5140 out%=OPENOUT(data$)
 5150 PRINT#out%,$subject%,qno%,quest%,s
ubj_asked%,subj_record%,subj_right%
 5160 FOR i%=0 TO quest%-1
 5170 PRINT#out%,qtype%(i%),record%(i%),
asked%(i%),ans%(i%),right%(i%),time%(i%)
,q$(i%)
 5180 FOR j%=0 TO ans%(i%)-1
 5190 PRINT#out%,a$(i%,j%)
 5200 NEXT
 5210 NEXT
 5220 PRINT#out%,flash%
 5230 IF flash%>0 THEN
 5240 FOR i%=0 TO flash%-1
 5250 PRINT#out%,f$(i%),ftype%(i%),fq%(i
%)
 5260 NEXT
 5270 ENDIF
 5280 FOR i%=0 TO 9
 5290 PRINT#out%,macro$(i%)
 5300 NEXT
 5310 CLOSE#out%
 5320 ENDPROC
 5330 :
 5340 DEF PROCload(n%)
 5350 LOCAL ok%
 5360 SYS "Hourglass_On"
 5370 ok%=FNtry_load(n%,err$)
 5380 SYS "Hourglass_Off"
 5390 IF NOT ok% ERROR 0,"Question file
error: "+err$
 5400 ENDPROC
 5410 :
 5420 DEF FNtry_load(n%,RETURN err$)
 5430 LOCAL ok%,i%
 5440 curq%=-1
 5450 cur_subj%=-1
 5460 ok%=TRUE
 5470 quest%=-1
 5480 flash%=-1
 5490 $subject%="DeskLearn"
 5500 q$()=""
 5510 a$()=""
 5520 macro$()=""
 5530 f$()=""
 5540 subj_asked%=0
 5550 subj_record%=0
 5560 subj_right%=0
 5570 ans%()=0
 5580 asked%()=0
 5590 record%()=0
 5600 right%()=0
 5610 qtype%()=-1
 5620 ftype%()=-1
 5630 fq%()=-1
 5640 time%()=-10
 5650 qno%=0
 5660 in%=OPENIN("<DeskLearn$Dir>.data."
+subj$(n%))
 5670 IF in%<>0 THEN
 5680 INPUT#in%,$subject%,qno%,quest%,su
bj_asked%,subj_record%,subj_right%
 5690 FOR i%=0 TO quest%-1
 5700 INPUT#in%,qtype%(i%),record%(i%),a
sked%(i%),ans%(i%),right%(i%),time%(i%),
q$(i%)
 5710 FOR j%=0 TO ans%(i%)-1
 5720 INPUT#in%,a$(i%,j%)
 5730 NEXT
 5740 NEXT
 5750 INPUT#in%,flash%
 5760 IF flash%>0 THEN
 5770 FOR i%=0 TO flash%-1
 5780 INPUT#in%,f$(i%),ftype%(i%),fq%(i%
)
 5790 NEXT
 5800 ENDIF
 5810 FOR i%=0 TO 9
 5820 INPUT#in%,macro$(i%)
 5830 NEXT
 5840 ELSE
 5850 in%=OPENIN("<DeskLearn$Dir>.Subjec
ts."+subj$(n%))
 5860 qpend%=FALSE
 5870 line%=0
 5880 WHILE NOT EOF#in% AND ok%
 5890 line$=FNstrip(GET$#in%)
 5900 IF line$="" THEN
 5910 qpend%=FALSE
 5920 ELSE
 5930 CASE LEFT$(line$,1) OF
 5940 WHEN "#":
 5950 WHEN "$":$subject%=FNstrip(MID$(li
ne$,3))
 5960 WHEN "@":
 5970 m$=MID$(line$,2,1)
 5980 IF m$>="0" AND m$<="9" THEN
 5990 i%=INSTR(line$,":")
 6000 IF i%<=0 THEN
 6010 ok%=FALSE
 6020 err$="Missing : at line "+STR$line
%
 6030 ELSE
 6040 macro$(VAL(m$))=FNstrip(MID$(line$
,i%+1))
 6050 ENDIF
 6060 ELSE
 6070 ok%=FALSE
 6080 err$="Illegal macro number at line
 "+STR$line%
 6090 ENDIF
 6100 WHEN "!":
 6110 flash%+=1
 6120 IF qpend% THEN fq%(flash%)=quest%
 6130 m$=MID$(line$,2,1)
 6140 IF m$>="0" AND m$<="9" THEN ftype%
(flash%)=VAL(m$)
 6150 i%=INSTR(line$,":")
 6160 IF i%>0 THEN
 6170 f$(flash%)=FNstrip(MID$(line$,i%+1
))
 6180 ELSE
 6190 ok%=FALSE
 6200 err$="Missing : at line "+STR$line
%
 6210 ENDIF
 6220 WHEN "?":
 6230 qpend%=TRUE
 6240 quest%+=1
 6250 m$=MID$(line$,2,1)
 6260 IF m$>="0" AND m$<="9" THEN qtype%
(quest%)=VAL(m$)
 6270 i%=INSTR(line$,":")
 6280 IF i%>0 THEN
 6290 q$(quest%)=FNstrip(MID$(line$,i%+1
))
 6300 ELSE
 6310 ok%=FALSE
 6320 err$="Missing : at line "+STR$line
%
 6330 ENDIF
 6340 ans%(quest%)=0
 6350 OTHERWISE
 6360 IF qpend% THEN
 6370 a$(quest%,ans%(quest%))=line$
 6380 ans%(quest%)+=1
 6390 ELSE
 6400 ok%=FALSE
 6410 err$="Line "+STR$line%+" is invali
d"
 6420 ENDIF
 6430 ENDCASE
 6440 ENDIF
 6450 line%+=1
 6460 ENDWHILE
 6470 IF quest%=0 AND NOT ok% ok%=FALSE:
err$="Null question file"
 6480 quest%+=1
 6490 flash%+=1
 6500 ENDIF
 6510 CLOSE#in%
 6520 IF NOT ok% THEN =FALSE
 6530 cur_subj%=n%
 6540 min_qno%=quest%/2
 6550 IF min_qno%>8 min_qno%=8
 6560 status%=stat_waiting%
 6570 next_time=FNtime
 6580 flash_time=FNtime
 6590 =ok%
 6600 :
 6610 DEF FNstrip(a$)
 6620 WHILE LEFT$(a$,1)=" "
 6630 a$=MID$(a$,2)
 6640 ENDWHILE
 6650 =a$
 6660 :
 6670 DEF FNmake_men(menu$,menutitle$)
 6680 LOCAL menumax%,wasptr%,i%,j%
 6690 wasptr%=menuptr%
 6700 menumax%=0
 6710 i%=0
 6720 menuptr%!20=44
 6730 $menuptr%=menutitle$
 6740 menuptr%!12=&70207
 6750 maxaddr%=menuptr%+16
 6760 menuptr%!24=0
 6770 menuptr%+=28
 6780 REPEAT
 6790 j%=i%+1
 6800 i%=INSTR(menu$+",",",",j%)
 6810 item$=MID$(menu$,j%,i%-j%)
 6820 IF item$<>"" THEN
 6830 IF LEN(item$)>menumax% menumax%=LE
N(item$)
 6840 menuptr%!0=0
 6850 menuptr%!4=-1
 6860 menuptr%!8=&7000021
 6870 $(menuptr%+12)=item$
 6880 menuptr%+=24
 6890 ENDIF
 6900 UNTIL item$=""
 6910 menuptr%!-24=(menuptr%!-24) OR &80
 6920 !maxaddr%=menumax%*16+32
 6930 =wasptr%
 6940 :
 6950 DEF PROCattach_sub_menu(m1%,m2%,i%
)
 6960 m2%!(32+24*i%)=m1%
 6970 ENDPROC
 6980 :
 6990 DEF PROCopen_menu(m%,x%,y%)
 7000 LOCAL i%
 7010 PROCtick(quit_menu%,3,stats%)
 7020 FOR i%=0 TO 5
 7030 PROCtick(int_menu%,i%,cur_int%=i%)
 7040 NEXT
 7050 FOR i%=0 TO subjects%-1
 7060 a%=subj_m%(i%)
 7070 IF subj_use%(i%) THEN !a%=!a% OR 1
 ELSE !a%=!a% AND &FFFFFFFE
 7080 IF NOT subj_valid%(i%) THEN a%!8=a
%!8 OR (1<<22)
 7090 NEXT
 7100 menux%=x%
 7110 menuy%=y%
 7120 SYS "Wimp_CreateMenu",,m%,x%,y%
 7130 ENDPROC
 7140 :
 7150 DEF PROCmenu_select
 7160 SYS "Wimp_GetPointerInfo",,temp%
 7170 redo%=((temp%!8) AND 1)>0
 7180 CASE !q% OF
 7190 WHEN 1:
 7200 SYS "Wimp_DecodeMenu",,quit_menu%,
q%,temp%
 7210 s$=MID$(FNget_str(temp%),9)
 7220 i%=-1
 7230 REPEAT
 7240 i%+=1
 7250 UNTIL i%=subjects% OR subj$(i%)=s$
 7260 IF i%<subjects% THEN
 7270 subj_use%(i%)=NOT subj_use%(i%)
 7280 IF i%=cur_subj% THEN
 7290 !temp%=q_hand%
 7300 SYS "Wimp_CloseWindow",,temp%
 7310 status%=stat_idle%
 7320 PROCsave_current
 7330 cur_subj%=-1
 7340 curq%=-1
 7350 PROCupdate_stats
 7360 IF SUM subj_use%()<>0 PROCset_next
 ELSE status%=stat_idle%
 7370 ENDIF
 7380 ENDIF
 7390 WHEN 2:IF q%!4>=0 cur_int%=q%!4:ne
xt_time=FNtime
 7400 WHEN 3:IF stats% PROCclose(s_hand%
) ELSE stats%=TRUE:PROCopen_in_centre(s_
hand%)
 7410 WHEN 4:IF q%!4=0 PROCopen_dir("Sub
jects") ELSE IF q%!4=1 PROCopen_dir("Dat
a")
 7420 WHEN 5:done%=TRUE
 7430 ENDCASE
 7440 IF redo% PROCopen_menu(quit_menu%,
menux%,menuy%)
 7450 ENDPROC
 7460 :
 7470 DEF PROCopen_dir(dir$)
 7480 SYS "XOS_GSTrans","<DeskLearn$Dir>
."+dir$,temp%,&100
 7490 SYS "XOS_CLI","Filer_OpenDir "+FNg
et_str(temp%)
 7500 ENDPROC
 7510 :
 7520 DEF PROCtick(a%,i%,c%)
 7530 a%=a%+28+24*i%
 7540 IF c% THEN !a%=!a% OR 1 ELSE !a%=!
a% AND &FFFFFFFE
 7550 ENDPROC
 7560 :
 7570 DEF PROCfade(a%,i%)
 7580 a%=a%+36+24*i%
 7590 !a%=!a% OR (1<<22)
 7600 ENDPROC
 7610 :
 7620 DEF PROCwarn(w$)
 7630 !temp%=17
 7640 $(temp%+4)=w$
 7650 SYS "Wimp_ReportError",temp%,1,"De
skLearn"
 7660 ENDPROC
 7670 :
 7680 DEF PROCclose(hand%)
 7690 !q%=hand%
 7700 IF hand%=s_hand% stats%=FALSE
 7710 SYS "Wimp_CloseWindow",,q%
 7720 ENDPROC
 7730 :
 7740 DEF FNtime
 7750 LOCAL t
 7760 SYS "OS_ReadMonotonicTime" TO t
 7770 =t
 7780 :
 7790 DEF FNsubst(temp$,arg$)
 7800 SYS "OS_SubstituteArgs",FNtogsep(t
emp$),subst_out%,&100,FNtogsep(arg$),LEN
(arg$)
 7810 =FNtogsep(FNget_str(subst_out%))
 7820 :
 7830 DEF FNsplit(s$,width%,show%,ox%,oy
%)
 7840 LOCAL i%,j%,lines%
 7850 lines%=0
 7860 WHILE s$<>""
 7870 IF LEN(s$)<=width% THEN
 7880 i%=LEN(s$)
 7890 ELSE
 7900 j%=0
 7910 i%=width%
 7920 REPEAT
 7930 j%=INSTR(s$," ",j%+1)
 7940 IF j%<=width% AND j%>0 i%=j%-1
 7950 UNTIL j%=0 OR j%>width%
 7960 ENDIF
 7970 IF show% THEN
 7980 MOVE ox%,oy%-40*lines%
 7990 PRINT LEFT$(s$,i%);
 8000 ENDIF
 8010 lines%+=1
 8020 s$=FNstrip(MID$(s$,i%+1))
 8030 ENDWHILE
 8040 =lines%
 8050 :
 8060 DEF FNtogsep($string%)
 8070 LOCAL i%
 8080 FOR i%=0 TO LEN($string%)-1
 8090 IF i%?string%=32 OR i%?string%=44
THEN i%?string%=i%?string% EOR 12
 8100 NEXT
 8110 =$string%
```

Listing 2 – MakeDat

```
   10 REM >MakeDat (Desklearn2)
   20 REM Create DeskLearn files
   30 REM by Dave Acton
   40 REM for 32-bit machines
   50 REM (c) BAU November 1992
   60 :
   70 DIM w% &4000
   80 REPEAT
   90 READ file$
  100 IF file$<>"*" THEN
  110 PRINT"Creating file """file$""""
  120 IF file$="!Run" THEN
  130 out%=OPENOUT(file$)
  140 REPEAT
  150 READ line$
  160 IF line$<>"*" BPUT#out%,line$
  170 UNTIL line$="*"
  180 CLOSE#out%
  190 OSCLI"SetType "+file$+" obey"
  200 ELSE
  210 READ load%,exec%,olen%
  220 p%=0
  230 d$=""
  240 dl%=1
  250 WHILE p%<olen%
  260 b%=FNb
  270 IF b%=130:p%?w%=FNb:p%+=1
  280 IF b%>=131 AND b%<=162 THEN
```

```
 290 n%=b%-128
 300 f%=p%-FNb
 310 FOR i%=0 TO n%-1
 320 ?(w%+p%+i%)=?(w%+f%+i%)
 330 NEXT
 340 p%+=n%
 350 ENDIF
 360 IF b%<130 OR b%>162 THEN p%?w%=b%:
p%+=1
 370 ENDWHILE
 380 SYS "OS_File",0,file$,,,w%,w%+p%
 390 SYS "OS_File",1,file$,load%,exec%,
,3
 400 ENDIF
 410 ENDIF
 420 UNTIL file$="*"
 430 PRINT'"Files created"
 440 END
 450 :
 460 DEF FNb
 470 LOCAL b%,c1%,c2%,i%
 480 IF d$="" THEN
 490 READ d$,c1%
 500 c2%=0
 510 FOR i%=1 TO LEN(d$)/2
 520 c2%+=EVAL("&"+MID$(d$,2*i%-1,2))
 530 NEXT
 540 IF c1%<>(c2% MOD 100) PRINT"Error
in DATA line ";dl%:END
 550 dl%+=1
 560 ENDIF
 570 b%=EVAL("&"+LEFT$(d$,2))
 580 d$=MID$(d$,3)
 590 =b%
 600 :
 610 DATA !Run
 620 DATA "Set DeskLearn$Dir <Obey$Dir>
"
 630 DATA "IconSprites <DeskLearn$Dir>.
!Sprites"
 640 DATA "WimpSlot -min 64K -max 64K"
 650 DATA "<DeskLearn$Dir>.!RunImage"
 660 DATA *
 670 DATA !Sprites
 680 DATA &FFFFF944,&C96AC43,&2E0
 690 DATA 01000000108304E4020000,82
 700 DATA D4830421646573 6B6C6561,9
 710 DATA 726E000004871C83230007,64
 720 DATA 83282C832C8083310C8514,63
 730 DATA 307577570387 1E0000AA85,42
 740 DATA 2827834E72881482A08514,1
 750 DATA 70842430843F8513852807,55
 760 DATA 00307703007085228 2A0AA,9
 770 DATA 0A873B707007833D842386,28
 780 DATA 26833C770507008316AAAA,53
 790 DATA AAAA87278452058564 8C13,25
 800 DATA 839F833D85158D1483DDBB,36
 810 DATA 0B84C2BB8C14B0BB840F84,26
 820 DATA 0587B584B3BB8315B0862D,26
 830 DATA 857A84F18329892689EA84,78
 840 DATA 1588270064774688 28893C,58
 850 DATA 2600628650BB0B892A8514,80
 860 DATA 8763B0878D64776683FA86,22
 870 DATA 9F87A0F0FFFFFF0F89D584,56
 880 DATA 0E000083138407 8A21FF85,62
 890 DATA 278929F0FF842386278729,28
 900 DATA 83138814864483FE844386,26
 910 DATA 3C0F856585478714886B84,43
 920 DATA 6C847F8C0D848185408821,47
 930 DATA 899F8D14854C00F084588A,64
 940 DATA 5686198814840A8685944A,32
 950 DATA 8A7888280F83ED8E78879D,71
 960 DATA 8D7885A385C08B6489A0FF,73
 970 DATA "Templates"
 980 DATA &FFFFEC44,&F40E449,&24C
 990 DATA FFFFFFF00000000830485,88
1000 DATA 0744830DB0010000018315,49
1010 DATA 70726F67496E666F0D8321,13
1020 DATA F48314588329841862 6C61,14
1030 DATA 6E6B0D1111883882928341,28
1040 DATA 829C0200000E0300007483,52
1050 DATA 04885064070000120031 82,24
1060 DATA 84070207010C0E0C8667FC,76
1070 DATA 83700586723D846530866C,80
1080 DATA 84847883788490138391 09,15
1090 DATA 8395A483543483A1548358,6
1100 DATA 6483A93D3000B70D4B0D74,9
1110 DATA 69746C65643E0DFE829A83,74
1120 DATA B9CC83C176837C8357FF3D,20
1130 DATA 6000074465736B4C656172,82
1140 DATA 6E83B5842082988720C884,67
1150 DATA 40610007828B87641583F5,69
1160 DATA 84408458844082948720 82,87
1170 DATA A08784288720308760 6087,44
1180 DATA 40AB87A41E83FD3E83FFD0,4
1190 DATA 83B18488F883B919000017,88
1200 DATA 4E616D653A0D86A00E83F2,37
1210 DATA 829C8720C4872050757270,39
1220 DATA 6F73832383C08444688740,18
1230 DATA 82908740417574686F723A,58
1240 DATA 0D884038876084808460 56,74
1250 DATA 657273696F6E854041626F,27
1260 DATA 757420746869732070726F,74
1270 DATA 6772616D0D84FF746F7020,94
1280 DATA 6C6561726E696E67206169,82
1290 DATA 640D446176652041637 46F,20
1300 DATA 6E0D302E31300D6E83FC78,40
1310 DATA 83E8680300001883048 3EB,95
1320 DATA 8405003C07000002000182,37
1330 DATA 850702070103010C8619FC,77
1340 DATA FFFF000586243D842B3000,69
1350 DATA 00833B85350DA3010083FF,39
1360 DATA FF872A00,32
1370 DATA *
```

Listing 3 – MakeQuest

```
  10 REM >MakeQuest (Desklearn3)
  20 REM Create sample DeskLearn questi
on file
  30 REM by Dave Acton
  40 REM for all machines
  50 REM (c) BAU November 1992
  60 :
  70 out%=OPENOUT"Africa"
  80 PROCwrites("$:African capital citi
es")
  90 PROCnew_line
 100 PROCwrites("@0:What is the capital
 city of %*0?")
 110 PROCwrites("@1:The capital of %0 i
s %1.")
 120 PROCnew_line
 130 REPEAT
 140 READ c$
 150 IF c$<>"*" READ d$:PROCwrites("?0:
"+c$):PROCwrites(d$):PROCwrites("!1:"):P
ROCnew_line
 160 UNTIL c$="*"
 170 CLOSE#out%
 180 END
 190 :
 200 DEF PROCwrites(s$)
 210 FOR i%=1 TO LEN(s$)
 220 BPUT#out%,ASCMID$(s$,i%,1)
 230 NEXT
 240 PROCnew_line
 250 ENDPROC
 260 :
 270 DEF PROCnew_line
 280 BPUT#out%,10
 290 ENDPROC
 300 :
 310 DATA Angola,Luanda,Burundi,Bujumbu
ra
 320 DATA Mali,Bamako,Mauritania,Nouakc
hott
 330 DATA Senegal,Dakar,Egypt,Cairo
 340 DATA Sudan,Khartoum,Ethiopia,Addis
 Ababa
 350 DATA the Central African Republic,
Bangui,Niger,Niamey
 360 DATA Chad,N'Djamena,Cameroon,Yaoun
dLET
 370 DATA Botswana,Gaborone,Namibia,Win
dhoek
 380 DATA Congo,Brazzaville,Tanzania,Da
r es Salaam
 390 DATA Kenya,Nairobi,Uganda,Kampala
 400 DATA Somalia,Mogadishu,Mozambique,
Maputo
 410 DATA *
```

Listing 4 – Learn8

```
  10 REM >Learn8 (Desklearn4)
  20 REM by Dave Acton
  30 REM for all machines
  40 REM (c) BAU November 1992
  50 :
  60 MODE 7
  70 VDU 23;8202;0;0;0;
  80 *FX 229,1
  90 PROCtitle(CHR$134+"Learn"+CHR$135+
"8")
 100 PROCinit
 110 err$="".
 120 PROCload
 130 CLS
 140 done%=FALSE
 150 REPEAT
 160 key%=INKEY(0)
 170 IF key%>=ASC"a" AND key%<=ASC"z" k
ey%=key%-32
 180 IF (key%=ASC"Q" OR key%=27) AND IN
KEY-1 done%=TRUE
 190 IF key%=ASC"L" PROCsave_current:PR
OCload
 200 status%=EVAL("FNq_"+n$(status%))
 210 flash_status%=EVAL("FNf_"+n$(flash
_status%))
 220 UNTIL done%
 230 CLS
 240 PRINT"Quitting..."
 250 PROCsave_current
 260 MODE 7
 270 *FX 229
 280 END
 290 :
 300 DEF PROCload
 310 PROCclear
 320 *FX 229
 330 REPEAT
 340 CLS
 350 IF err$<>"" PROCsplit(err$,36,129)
:PRINT
 360 *CAT S
 370 INPUT'"Load: "file$
 380 err$=FNtry_load(file$)
 390 UNTIL err$=""
 400 *FX 229,1
 410 ENDPROC
 420 :
 430 DEF FNf_next
 440 IF TIME<flash_time% OR flash%=0 TH
EN =flash_status%
 450 IF flash%=1 i%=0 ELSE i%=RND(flash
%)-1
 460 IF ftype%(i%)=curq% THEN =flash_st
atus%
 470 IF ftype%(i%)=-1 THEN flash$=f$(i%
) ELSE IF f$(i%)<>"" THEN flash$=FNsubst
(f$(i%),macro$(ftype%(i%))) ELSE IF fq%(
i%)<>-1 THEN flash$=FNsubst(q$(fq%(i%))+
","+a$(fq%(i%),0),macro$(ftype%(i%)))
 480 flash_time%=TIME+6*LEN(flash$)
 490 PRINTTAB(0,15);
 500 PROCsplit(flash$,36,135)
 510 =stat_reveal%
 520 :
 530 DEF FNf_reveal
 540 IF TIME<flash_time% THEN =flash_st
atus%
 550 VDU 28,1,20,39,18,12,28,1,24,39,3
 560 flash_time%=TIME+6000*(RND(1)+0.5)
 570 =stat_next%
 580 :
 590 DEF FNq_next
 600 PROChourglass_on
 610 IF qno% MOD 2=0 THEN comp$="FNolde
r":j%=0 ELSE comp$="FNharder":j%=-1:REPE
AT:j%=j%+1:UNTIL time%(j%)<qno%-min_qno%
 620 FOR i%=0 TO quest%-1
 630 IF EVAL(comp$)>0 j%=i%
 640 NEXT
 650 i%=RND(quest%)-1
 660 w%=i%
 670 IF RND>0 k%=1 ELSE k%=quest%-1
 680 REPEAT
 690 i%=(i%+k%) MOD quest%
 700 UNTIL EVAL(comp$)=0 OR i%=w%
 710 curq%=i%
 720 IF qtype%(curq%)>=0 quest$=FNsubst
(q$(curq%),macro$(qtype%(curq%))) ELSE q
uest$=q$(curq%)
 730 IF ans%(curq%)>1 THEN choices%=ans
%(curq%):FOR i%=0 TO choices%-1:choice$(
i%)=a$(curq%,i%):NEXT ELSE PROCpool
 740 correct%=0
 750 FOR i%=1 TO 10
 760 a%=RND(choices%)-1
 770 b%=RND(choices%)-1
 780 temp$=choice$(a%)
 790 choice$(a%)=choice$(b%)
 800 choice$(b%)=temp$
 810 IF a%=correct% correct%=b% ELSE IF
 b%=correct% correct%=a%
 820 NEXT
 830 PROChourglass_off
 840 PROCshow_quest(-1,0,"Press A - "+C
HR$(choices%+64)+" to answer",136)
 850 PROCupdate_stats
 860 =stat_asking%
 870 :
 880 DEF PROCpool
 890 pool%=0
 900 FOR i%=0 TO quest%-1
 910 IF i%<>curq% AND qtype%(i%)=qtype%
(curq%) AND ans%(i%)=1 THEN pool$(pool%)
=a$(i%,0):pool%=pool%+1
 920 NEXT
 930 choice$(0)=a$(curq%,0)
 940 choices%=1
 950 left%=pool%
 960 IF left%=0 ENDPROC
 970 REPEAT
 980 REPEAT
 990 r%=RND(pool%)-1
1000 UNTIL pool$(r%)<>""
1010 choice$(choices%)=pool$(r%)
1020 pool$(r%)=""
1030 left%=left%-1
1040 choices%=choices%+1
1050 UNTIL choices%=4 OR left%=0
1060 ENDPROC
1070 :
1080 DEF PROCshow_quest(which%,which_co
l%,m$,m_col%)
1090 LOCAL i%,c%
1100 IF status%=stat_next% VDU 28,1,17,
39,3,12,28,1,24,39,3 ELSE VDU 30
1110 PROCsplit(quest$,36,131)
1120 PRINT
1130 FOR i%=0 TO choices%-1
1140 IF i%=which% c%=which_col% ELSE c%
=130
1150 PROCsplit(CHR$(i%+65)+". "+choice$
(i%),36,c%)
1160 PRINT
1170 NEXT
1180 PRINT
1190 PROCsplit(m$,36,m_col%)
1200 ENDPROC
1210 :
1220 DEF FNolder=SGN(time%(j%)-time%(i%
))
1230 :
1240 DEF FNharder
1250 IF time%(i%)>=qno%-min_qno% THEN =
-1
1260 IF FNscore(i%)<>FNscore(j%) THEN =
SGN(FNscore(j%)-FNscore(i%)) ELSE =FNold
er
1270 :
1280 DEF FNscore(i%)
1290 IF asked%(i%)=0 THEN =100 ELSE =IN
T(100*right%(i%)/asked%(i%))
1300 :
1310 DEF FNq_asking
1320 IF key%<65 OR key%>=65+choices% TH
EN =status%
1330 pick%=key%-65
1340 PROCshow_quest(pick%,135,"",0)
1350 next_time%=TIME+100
1360 =stat_picked%
1370 :
1380 DEF FNq_picked
1390 IF TIME<next_time% THEN =status%
1400 PROCanalyse
1410 next_time%=TIME+400
1420 IF pick%=correct% PROCshow_quest(p
ick%,135,"Yes, that is correct!",134):=s
tat_right% ELSE PROCshow_quest(pick%,129
,"Sorry, that is incorrect",129):=stat_w
rong%
1430 :
1440 DEF PROCanalyse
1450 IF rec_record%>=&8000 rec_right%=r
ec_right%-1
1460 rec_record%=(rec_record%*2) AND &F
FFF
1470 IF pick%=correct% THEN rec_record%
=rec_record% OR 1:rec_right%=rec_right%+
1
1480 IF rec_asked%<16 rec_asked%=rec_as
ked%+1
1490 IF record%(curq%)>=&8000 right%(cu
rq%)=right%(curq%)-1
1500 record%(curq%)=(record%(curq%)*2)
AND &FFFF
1510 IF pick%=correct% THEN record%(cur
q%)=record%(curq%) OR 1:right%(curq%)=ri
ght%(curq%)+1
1520 IF asked%(curq%)<16 asked%(curq%)=
asked%(curq%)+1
1530 IF subj_record%>=&8000 subj_right%
=subj_right%-1
1540 subj_record%=(subj_record%*2) AND
&FFFF
1550 IF pick%=correct% THEN subj_record
%=subj_record% OR 1:subj_right%=subj_rig
ht%+1
1560 IF subj_asked%<16 subj_asked%=subj
_asked%+1
1570 time%(curq%)=qno%+RND(5)-3
1580 IF (record%(curq%) AND 15)=15 time
%(curq%)=time%(curq%)+quest%/8
1590 PROCupdate_stats
1600 qno%=qno%+1
1610 ENDPROC
1620 :
1630 DEF FNq_right
1640 IF TIME<next_time% THEN =status%
1650 =stat_next%
1660 :
1670 DEF FNq_wrong
1680 IF TIME<next_time% THEN =status%
1690 next_time%=TIME+400
1700 PROCshow_quest(correct%,136,"This
is the right answer",134)
1710 =stat_reveal%
1720 :
1730 DEF FNq_reveal
1740 IF TIME<next_time% THEN =status% E
LSE =stat_next%
1750 :
1760 DEF PROCsplit(s$,width%,col%)
1770 LOCAL i%,j%
1780 REPEAT
1790 IF LEN(s$)<=width% THEN i%=LEN(s$)
 ELSE i%=width%:FOR j%=1 TO width%:IF AS
CMID$(s$,j%)=32 i%=j%:NEXT ELSE NEXT
1800 PRINT CHR$(col%)LEFT$(s$,i%)
1810 s$=FNstrip(MID$(s$,i%+1))
1820 UNTIL s$=""
1830 ENDPROC
1840 :
1850 DEF PROCupdate_stats
1860 PRINTTAB(0,18)"STATISTICS"
1870 PROCshow_stats(19,rec_asked%,rec_r
ecord%,rec_right%,"This session")
1880 PROCshow_stats(20,asked%(curq%),re
cord%(curq%),right%(curq%),"Current ques
tion")
1890 PROCshow_stats(21,subj_asked%,subj
_record%,subj_right%,"Current subject")
1900 ENDPROC
1910 :
1920 DEF PROCshow_stats(y%,asked%,recor
d%,right%,s$)
1930 LOCAL i%
1940 PRINTTAB(0,y%)CHR$133;s$TAB(17,y%)
;CHR$134;
1950 FOR i%=0 TO 15
1960 IF i%>=asked% THEN VDU 46 ELSE IF
(record% AND (2^i%))<>0 VDU 89 ELSE VDU
78
1970 NEXT
1980 PRINTTAB(34,y%);
1990 IF asked%>0 PRINTRIGHT$("  "+STR$(
INT(100*right%/asked%)),3)"%"; ELSE PRIN
TSPC4;
2000 ENDPROC
2010 :
2020 DEF PROCtitle(t$)
2030 VDU 26,12
2040 FOR i%=0 TO 1
2050 PRINTTAB(0,i%)CHR$132CHR$157SPC(18
-LEN(t$)/2)CHR$141;t$
2060 NEXT
2070 VDU 28,1,24,39,3
2080 ENDPROC
2090 :
2100 DEF PROCinit
2110 max_q%=100
2120 max_f%=100
2130 max_subj%=100
```

```
 2140 DIM q$(max_q%),a$(max_q%,3),ans%(m
ax_q%),time%(max_q%),asked%(max_q%),reco
rd%(max_q%),f$(max_q%),ftype%(max_f%),fq
%(max_f%)
 2150 DIM qtype%(max_q%),right%(max_q%),
pool$(max_q%)
 2160 DIM choice$(3),macro$(9),arg$(9),n
$(5),c%(255)
 2170 cur_subj$=""
 2180 cur_int%=2
 2190 rec_record%=0
 2200 rec_right%=0
 2210 rec_asked%=0
 2220 FOR i%=0 TO 5
 2230 READ n$(i%)
 2240 NEXT
 2250 stat_next%=0
 2260 stat_asking%=1
 2270 stat_picked%=2
 2280 stat_reveal%=3
 2290 stat_right%=4
 2300 stat_wrong%=5
 2310 status%=stat_next%
 2320 flash_status%=stat_next%
 2330 flash_time%=TIME
 2340 FOR i%=0 TO 255
 2350 c%(i%)=i%
 2360 NEXT
 2370 PROCmap(192,197,"A")
 2380 PROCmap(200,203,"E")
 2390 PROCmap(204,207,"I")
 2400 PROCmap(210,214,"O")
 2410 PROCmap(218,220,"U")
 2420 PROCmap(224,229,"a")
 2430 PROCmap(232,235,"e")
 2440 PROCmap(236,239,"i")
 2450 PROCmap(241,246,"o")
 2460 PROCmap(249,252,"u")
 2470 ENDPROC
 2480 :
 2490 DEF PROCmap(a%,b%,c$)
 2500 FOR i%=a% TO b%
 2510 c%(i%)=ASC(c$)
 2520 NEXT
 2530 ENDPROC
 2540 :
 2550 DEF FNsubst(arg$,temp$)
 2560 LOCAL arg%,r$,i%
 2570 arg%=0
 2580 FOR i%=0 TO 9
 2590 arg$(i%)=""
 2600 NEXT
 2610 r$=""
 2620 REPEAT
 2630 arg$=FNstrip(arg$)
 2640 IF arg$<>"" PROCsubst_arg
 2650 UNTIL arg$="" OR arg%=10
 2660 REPEAT
 2670 i%=INSTR(temp$,"%")
 2680 IF i%=0 i%=LEN(temp$)+1
 2690 r$=r$+LEFT$(temp$,i%-1)
 2700 temp$=MID$(temp$,i%)
 2710 IF LEFT$(temp$,1)="%" temp$=FNspec
ial
 2720 UNTIL temp$=""
 2730 =r$
 2740 :
 2750 DEF FNspecial
 2760 LOCAL i%
 2770 IF MID$(temp$,2,1)>="0" AND MID$(t
emp$,2,1)<="9" THEN r$=r$+arg$(VALMID$(t
emp$,2,1)):=MID$(temp$,3)
 2780 IF MID$(temp$,2,1)<>"*" OR MID$(te
mp$,3,1)<"0" OR MID$(temp$,3,1)>"9" THEN
 r$=r$+"%":=MID$(temp$,2)
 2790 FOR i%=VALMID$(temp$,3,1) TO 9
 2800 r$=r$+arg$(i%)
 2810 NEXT
 2820 =MID$(temp$,4)
 2830 :
 2840 DEF PROCsubst_arg
 2850 LOCAL i%
 2860 i%=INSTR(arg$,",")
 2870 IF i%=0 i%=LEN(arg$)+1
 2880 arg$(arg%)=LEFT$(arg$,i%-1)
 2890 arg$=MID$(arg$,i%+1)
 2900 arg%=arg%+1
 2910 ENDPROC
 2920 :
 2930 DEF FNstrip(a$)
 2940 REPEAT
 2950 IF LEFT$(a$,1)=" " a$=MID$(a$,2)
 2960 UNTIL LEFT$(a$,1)<>" "
 2970 =a$
 2980 :
 2990 DEF PROCclear
 3000 LOCAL i%,j%
 3010 FOR i%=0 TO max_q%-1
 3020 q$(i%)=""
 3030 ans%(i%)=0
 3040 asked%(i%)=0
 3050 record%(i%)=0
 3060 right%(i%)=0
 3070 qtype%(i%)=-1
 3080 ftype%(i%)=-1
 3090 fq%(i%)=0
 3100 time%(i%)=-10
 3110 FOR j%=0 TO 3
 3120 a$(i%,j%)=""
 3130 NEXT
 3140 NEXT
 3150 FOR i%=0 TO max_f%-1
 3160 f$(i%)=""
 3170 NEXT
 3180 FOR i%=0 TO 9
 3190 macro$(i%)=""
 3200 NEXT
 3210 need_to_clear%=FALSE
 3220 ENDPROC
 3230 :
 3240 DEF FNtry_load(file$)
 3250 LOCAL err$
 3260 PROChourglass_on
 3270 err$=""
 3280 file$=FNstrip(file$)
 3290 IF file$="" THEN ="Bad file name"
 3300 curq%=-1
 3310 quest%=-1
 3320 flash%=-1
 3330 title$="DeskLearn"
 3340 subj_asked%=0
 3350 subj_record%=0
 3360 subj_right%=0
 3370 qno%=0
 3380 in%=OPENIN("D."+file$)
 3390 IF in%<>0 PROCdata_load(in%) ELSE
in%=OPENIN("S."+file$):IF in%=0 THEN ="N
o such file" ELSE PROCtext_load(in%)
 3400 CLOSE#in%
 3410 PROChourglass_off
 3420 IF quest%<=0 THEN ="Null question
file"
 3430 IF err$<>"" THEN =err$ ELSE cur_su
bj$=file$
 3440 min_qno%=quest%/2
 3450 IF min_qno%>8 min_qno%=8
 3460 status%=stat_next%
 3470 next_time=TIME
 3480 flash_time=TIME
 3490 =""
 3500 :
 3510 DEF PROCtext_load(in%)
 3520 qpend%=FALSE
 3530 line%=0
 3540 REPEAT
 3550 line$=FNstrip(FNgets(in%))
 3560 IF line$="" qpend%=FALSE ELSE PROC
line(line$)
 3570 line%=line%+1
 3580 UNTIL PTR#in%=EXT#in% OR err$<>""
 3590 quest%=quest%+1
 3600 flash%=flash%+1
 3610 ENDPROC
 3620 :
 3630 DEF PROCline(line$)
 3640 c$=LEFT$(line$,1)
 3650 IF c$="#" ENDPROC
 3660 IF c$="$":title$=FNstrip(MID$(line
$,3)):ENDPROC
 3670 IF c$="@":PROCload_macro(MID$(line
$,2)):ENDPROC
 3680 IF c$="!":PROCload_flash(line$):EN
DPROC
 3690 IF c$="?":PROCload_quest(line$):EN
DPROC
 3700 IF NOT qpend% THEN err$="Line "+ST
R$line%+" is invalid":ENDPROC
 3710 a$(quest%,ans%(quest%))=line$
 3720 ans%(quest%)=ans%(quest%)+1
 3730 ENDPROC
 3740 :
 3750 DEF PROCload_macro(m$)
 3760 IF m$<"0" OR m$>"9" THEN err$="Ill
egal macro number at line "+STR$line%:EN
DPROC
 3770 i%=INSTR(line$,":")
 3780 IF i%<=0 THEN err$="Missing : at l
ine "+STR$line%:ENDPROC
 3790 macro$(VAL(m$))=FNstrip(MID$(line$
,i%+1))
 3800 ENDPROC
 3810 :
 3820 DEF PROCload_flash(line$)
 3830 flash%=flash%+1
 3840 IF qpend% THEN fq%(flash%)=quest%
 3850 m$=MID$(line$,2,1)
 3860 IF m$>="0" AND m$<="9" THEN ftype%
(flash%)=VAL(m$)
 3870 i%=INSTR(line$,":")
 3880 IF i%>0 THEN f$(flash%)=FNstrip(MI
D$(line$,i%+1)) ELSE err$="Missing : at
line "+STR$line%
 3890 ENDPROC
 3900 :
 3910 DEF PROCload_quest(line$)
 3920 qpend%=TRUE
 3930 quest%=quest%+1
 3940 m$=MID$(line$,2,1)
 3950 IF m$>="0" AND m$<="9" THEN qtype%
(quest%)=VAL(m$)
 3960 i%=INSTR(line$,":")
 3970 IF i%>0 THEN q$(quest%)=FNstrip(MI
D$(line$,i%+1)) ELSE err$="Missing : at
line "+STR$line%:ENDPROC
 3980 ans%(quest%)=0
 3990 ENDPROC
 4000 :
 4010 DEF PROCdata_load(in%)
 4020 INPUT#in%,title$,qno%,quest%,subj_
asked%,subj_record%,subj_right%
 4030 FOR i%=0 TO quest%-1
 4040 INPUT#in%,qtype%(i%),record%(i%),a
sked%(i%),ans%(i%),right%(i%),time%(i%),
q$(i%)
 4050 FOR j%=0 TO ans%(i%)-1
 4060 INPUT#in%,a$(i%,j%)
 4070 NEXT
 4080 NEXT
 4090 INPUT#in%,flash%
 4100 IF flash%>0 THEN FOR i%=0 TO flash
%-1:INPUT#in%,f$(i%),ftype%(i%),fq%(i%):
NEXT
 4110 FOR i%=0 TO 9
 4120 INPUT#in%,macro$(i%)
 4130 NEXT
 4140 ENDPROC
 4150 :
 4160 DEF FNgets(in%)
 4170 LOCAL c%,s$
 4180 s$=""
 4190 IF EXT#in%=PTR#in% THEN =s$
 4200 REPEAT
 4210 c%=c%(BGET#in%)
 4220 IF c%>=32 THEN s$=s$+CHR$c%
 4230 UNTIL c%<32 OR PTR#in%=EXT#in%
 4240 =s$
 4250 :
 4260 DEF PROCsave_current
 4270 LOCAL i%,j%
 4280 PROChourglass_on
 4290 IF cur_subj$="" ENDPROC
 4300 out%=OPENOUT("D."+cur_subj$)
 4310 PRINT#out%,title$,qno%,quest%,subj
_asked%,subj_record%,subj_right%
 4320 FOR i%=0 TO quest%-1
 4330 PRINT#out%,qtype%(i%),record%(i%),
asked%(i%),ans%(i%),right%(i%),time%(i%)
,q$(i%)
 4340 FOR j%=0 TO ans%(i%)-1
 4350 PRINT#out%,a$(i%,j%)
 4360 NEXT
 4370 NEXT
 4380 PRINT#out%,flash%
 4390 IF flash%>0 THEN FOR i%=0 TO flash
%-1:PRINT#out%,f$(i%),ftype%(i%),fq%(i%)
:NEXT
 4400 FOR i%=0 TO 9
 4410 PRINT#out%,macro$(i%)
 4420 NEXT
 4430 CLOSE#out%
 4440 cur_subj$=""
 4450 PROChourglass_off
 4460 ENDPROC
 4470 :
 4480 DEF PROChourglass_on
 4490 VDU 26
 4500 PRINTTAB(32,0)CHR$136CHR$134CHR$14
0"BUSY"
 4510 VDU 28,1,24,39,3
 4520 ENDPROC
 4530 :
 4540 DEF PROChourglass_off
 4550 VDU 26
 4560 PRINTTAB(32,0)SPC7
 4570 VDU 28,1,24,39,3
 4580 ENDPROC
 4590 :
 4600 DATA next,asking,picked,reveal,rig
ht,wrong
```

ASSEMBLY LINE

Listing 1 – Arm1

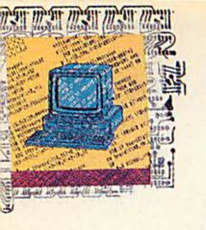
```
   10 REM >ARM1
   20 REM By Dave Lawrence
   30 REM For 32 bit machines
   40 REM (C) BAU November 1992
   50 :
   60 DIM code 100
   70 array=0
   80 number=1
   90 total=2
  100 value=3
  110 link=14
  120 pc=15
  130 FOR pass=0 TO 2 STEP 2
  140 P%=code
  150 [OPT pass
  160 .sum
  170          MOV     total,#0
  180 .loop
  190          LDR     value,[array],#4
  200          ADD     total,total,value
  210
  220          SUBS    number,number,#1
  230          BNE     loop
  240
  250          MOV     R0,total
  260
  270          MOV     pc,link
  280 ]NEXT
  290 numbers=10
  300 total=0
  310 DIM data numbers*4
  320 PRINT "Numbers      : ";
  330 FOR i=0 TO numbers-1
  340   n=RND(100)
  350   data!(i*4)=n
  360   total+=n
  370   PRINT;n;" ";
  380 NEXT i
  390 PRINT'"BASIC total : ";total
  400 A%=data
  410 B%=numbers
  420 PRINT"ARM total    : ";USR(sum)
```

Listing 2 – Arm2

```
   10 REM >ARM2
   20 REM By Dave Lawrence
   30 REM For 32 bit machines
   40 REM (C) BAU November 1992
   50 :
   60 DIM code 100
   70 addr=1
   80 link=14
   90 pc=15
  100 FOR pass=0 TO 2 STEP 2
  110 P%=code
  120 [OPT pass
  130 .printword
  140          ADR     addr,words
  150          LDRB    R0,[addr,R0,ASL #2
]!
  160          SWI     "OS_WriteC"
  170          LDRB    R0,[addr,#1]!
  180          SWI     "OS_WriteC"
  190          LDRB    R0,[addr,#1]!
  200          SWI     "OS_WriteC"
  210          LDRB    R0,[addr,#1]!
  220          SWI     "OS_WriteC"
  230
  240          MOV     pc,link
  250
  260 .words   EQUS    "ACES"
  270          EQUS    "BOMB"
  280          EQUS    "CURB"
  290          EQUS    "DARE"
  300          EQUS    "EASY"
  310          EQUS    "FATE"
  320          EQUS    "GLUM"
  330          EQUS    "HIRE"
  340 ]NEXT
  350 FOR A%=0 TO 7
  360   PRINT "Word ";A%;" = ";
  370   CALL printword
  380   PRINT
  390 NEXT
```

Listing 3 – Arm3

```
   10 REM >ARM3
   20 REM By Dave Lawrence
   30 REM For 32 bit machines
   40 REM (C) BAU November 1992
   50 :
   60 DIM code 100
   70 addr=1
   80 link=14
   90 pc=15
  100 FOR pass=0 TO 2 STEP 2
  110 P%=code
  120 [OPT pass
  130 .printword
  140          ADR     addr,words
  150
  160          ADD     R0,addr,R0,ASL #2
  170          MOV     R1,#4
  180          SWI     "OS_WriteN"
  190
  200          MOV     pc,link
  210
  220 .words   EQUS    "ACES"
  230          EQUS    "BOMB"
  240          EQUS    "CURB"
  250          EQUS    "DARE"
  260          EQUS    "EASY"
  270          EQUS    "FATE"
  280          EQUS    "GLUM"
  290          EQUS    "HIRE"
  300 ]NEXT
  310 FOR A%=0 TO 7
  320   PRINT "Word ";A%;" = ";
  330   CALL printword
  340   PRINT
  350 NEXT
```



YOUR NAME **HERE**

Paul James explains how to get your programs into print

Programming can be educational, very practical – and above all, fun. Everybody should dabble in programming on an Acorn machine – being able to write that quick and easy little proggie that sorts through a text file and removes all the unwanted characters, or one that formats floppies after each keypress, allows you to explore the flexibility of your machine.

The Basic language supplied with all Acorn machines is powerful too. Most of the programs that *BBC Acorn User* has published have been written in Basic, the language that practically anyone can use.

Basic can do some amazing thing. Just take a look at the two featured applications this month, *Desklearn* and *SimpleDTP*. Both are Basic programs, albeit quite complex ones, but nonetheless written in a language that most can learn, or use to improve their knowledge of programming. Of course, Basic programs don't have to be massive and complex to be useful and interesting. Take a look at *INFO for some programs that are not electronic versions of *War and Peace*, but more of a Ray Bradbury short story.

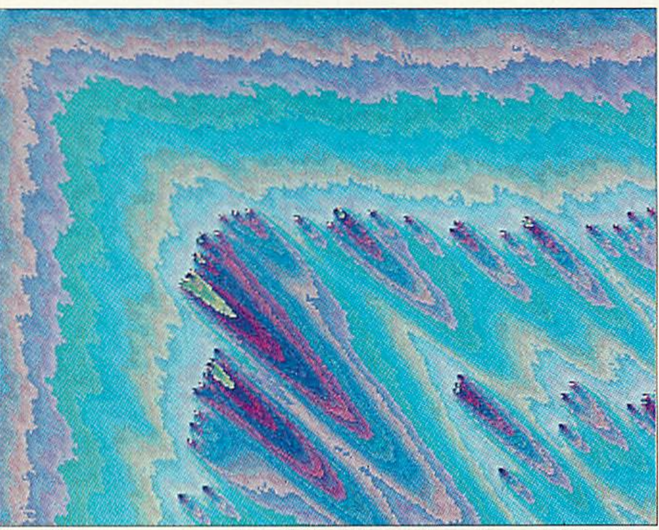
What you may not realise is that many of the programs you see, use and read about in the *BBC Acorn User* programming section are written by you, the reader. *INFO is a programming 'hot pot' that call for vital ingredients, ie, the programs that you write. The dish obviously needs to be stirred sometimes, via the questions you ask on how programs are written.

Master chefs David Lawrence and David Acton are keen to see your programs and, if published, you can expect a cash reward, everlasting fame and appreciation from our devoted readers.

So, if you've got a program or application that you would like to share with others, how do you get it onto these pages? Well, it's quite simple really. If you think your program is suitable for *INFO then send it in on a disc with a short explanation of what it does and how it works. It is a good idea to include this information as just a text file on the disc – this not only saves paper, but is a safeguard in the unlikely event of your letter being separated from the program disc. Don't forget to include your name and address, and if you're a younger reader, your age. If we decide that your program is one that would excite, inspire or amuse other readers, then you can expect to see it reproduced, although be patient – there is a pile of programs itching to be spread around the Acorn world via *INFO, so it may be a couple of months before yours sees the light of day and appears in *BAU*.

But what happens if you find your mind running away with the possibilities of this program or application you've written? What happens when you sit down to write a few words about it, and end up writing a book? Well this may be a special case. If your program has features which are new and exciting, then it may deserve that extra special treatment, it may deserve an article of its own. In this case you can expect your program to be spread across one or more pages as a main feature.

Assuming you have caught the programming bug, send your discs to: Program Submissions/*INFO, *BBC Acorn User*, Redwood Publishing, 101 Bayham Street London, NW1 0AG.



One of the many programs from *INFO this month, could you do better?

PROGRAM CHECKLIST

DO make sure that your program is written to *BAU* style
DO make sure that the disc is marked clearly with which format it is and what machines it will work on
DO make sure that you include your age if you're a young reader
DO make sure that your name and address is marked clearly on the disc
DO make sure that your program is your own work
DON'T send in reams of paper with listings on in a huge envelope
DON'T write thousands of words about your program. A short explanation will do at first
DON'T despair if you program doesn't appear quickly – be patient!
DON'T forget to include an sae for the safe return of your material

PROGRAMMING STYLE

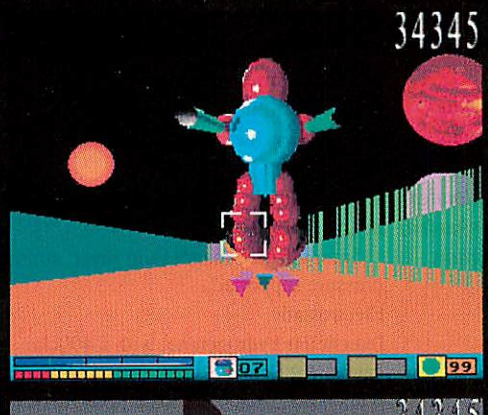
Most of the programs featured in *INFO can be found on our yellow pages. If you look at the yellow pages you'll notice that *BAU* programs have a certain style which you should make sure that your submitted program follows. This makes it easier for other readers to type your program in, and for us to understand how it works.

Your program should be well structured – no GOTOs, or GOSUBs or unclosed loops, except where necessary. Clearly defined, and descriptive variable names are important. And everything that is not a Basic keyword (ie, variables) should be in lower case: this includes procedure and function names. Line numbers should go up in tens and the program must be able to work after a RENUMBER command. Procedures and long listings should be separated with colons to create easy rest points.

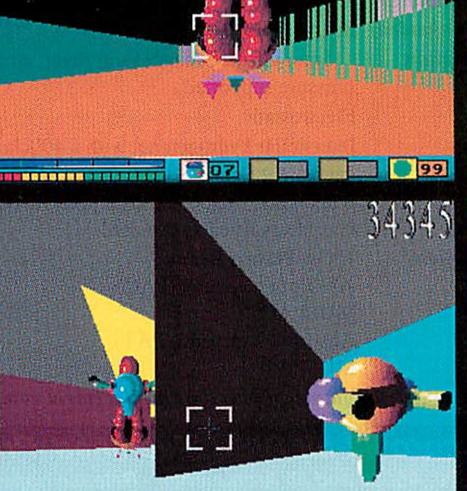
Take a look below at a 'perfect' *BBC Acorn User* program. This is what your program should look like. Note the explanatory REMarks at the beginning detailing the program's name, who you are and which machines it will work on. Line 40 obviously depends on when your program is published!

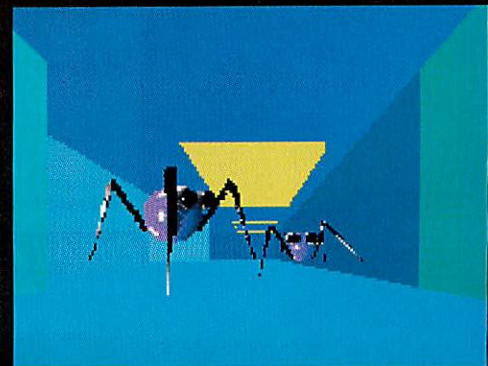
```
10 REM >Testprog
20 REM by Some Body
30 REM for B/B+/M/C/A
40 REM (c) BAU ??? 19??
50 :
60 MODE 1
70 PROCprocedure
80 variable%=FNfunction
90 REPEAT
100 variable%=variable%+1
110 UNTIL variable%=100
120 PRINT "Variable%=";variable%
130 END
140 :
150 DEF PROCprocedure
160 PRINT"Procedure"
170 ENDPROC
180 :
190 DEF FNfunction
200 =1
```


34345
SYSTEM FAILURE
07
99


34345
07
99

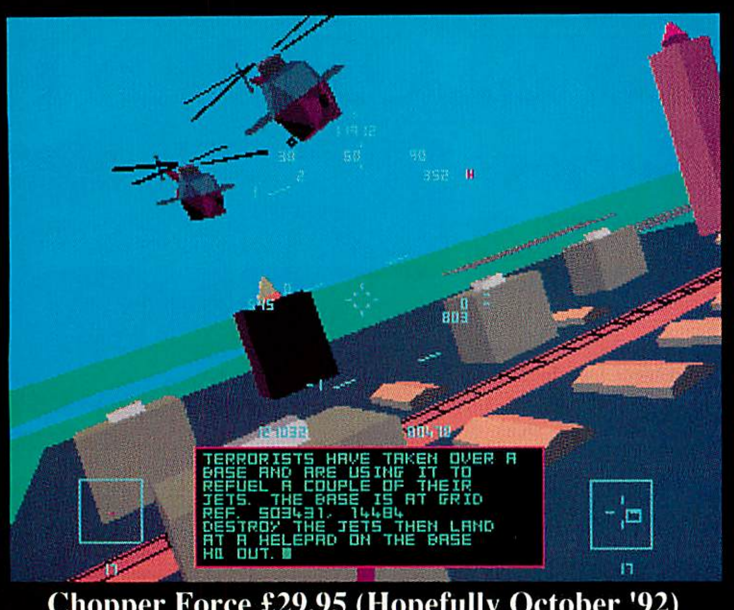

34345
WARNING
ENERGY LOW
07
99


34345
07
99

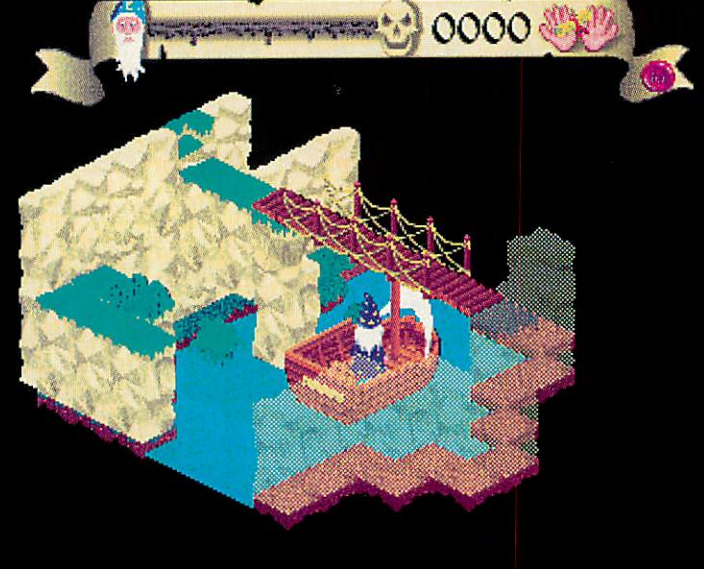


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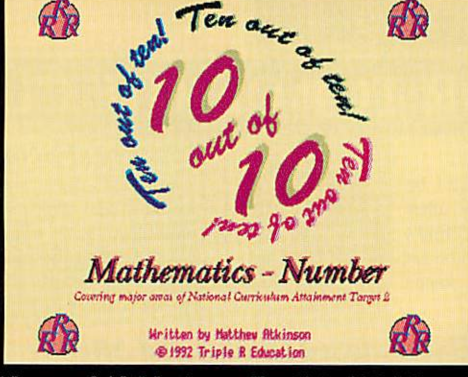
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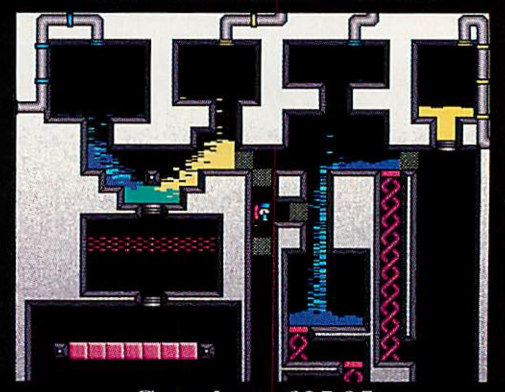
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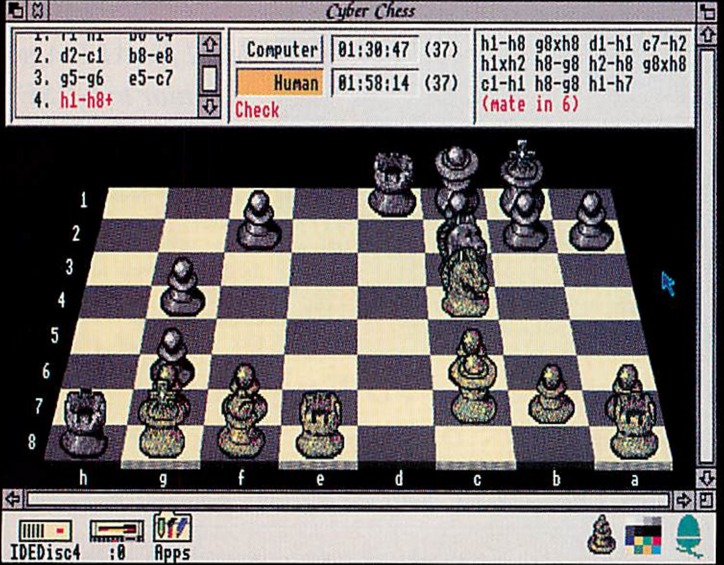
Chocks Away Compendium** £39.95



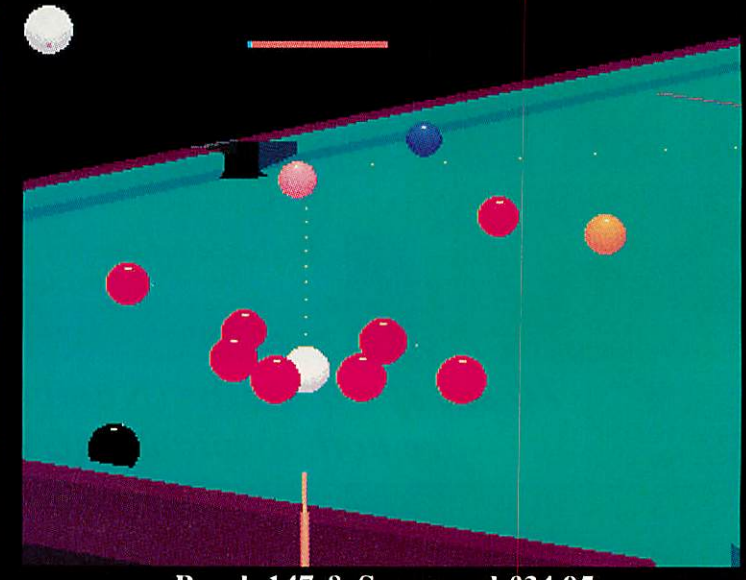
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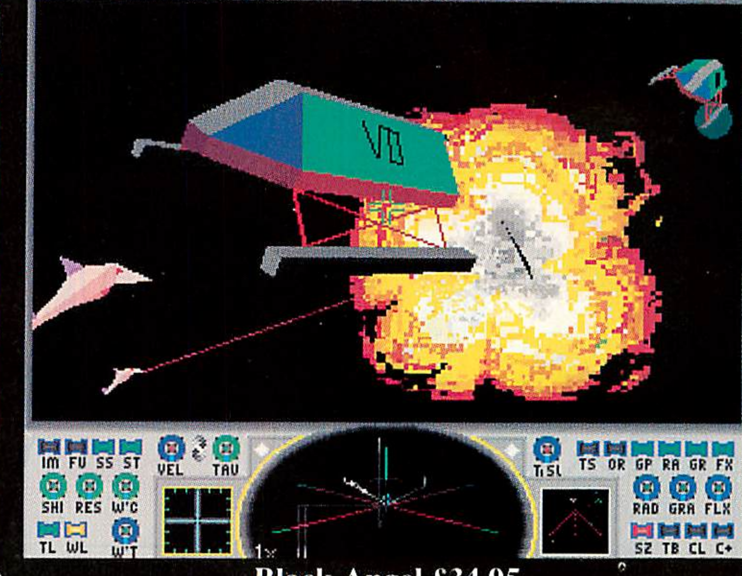
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MUST End.....24th December 1992

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** Game titles followed by these symbols require 2Mb minimum with RISC OS 3. (This is due to the applications in-built into this new operating system).

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CD-ROM AND MULTIMEDIA

Beginner's Guide

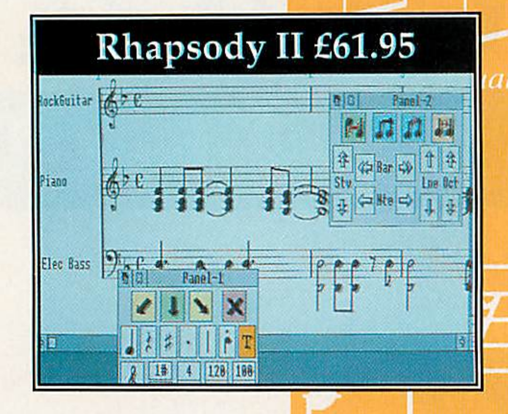
CD-Rom round-up

Make your own multimedia presentation

Multimedia in schools

Look to the future

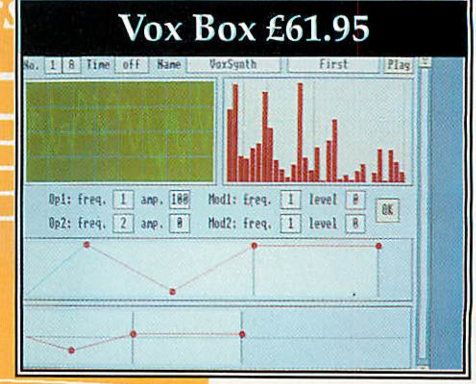
PROGRAMS TO BRING MUSIC TO YOUR EARS



Clares bring you a range of music software that is fast becoming the standard on the Archimedes.

Rhapsody II is a music notation package that allows you to write and modify musical scores. It is to music what a word processor is to words.

The notes can be entered by hand or, using a Midi keyboard, they can be captured in real time or step time. Once the music has been captured you can edit it, transcribe it, add lyrics, repeats, trills, slurs etc. You can transpose the score or just parts of it, you can play it back through Midi, you can even use it as an unpaid accompanist to your practice sessions. Most importantly you can print your finished score using any printer and RISC OS printer drivers. Quite simply, Rhapsody II lets you get back to the music AND gives you time to enjoy it. Many users wonder how they ever managed without it! Ask us for a demonstration version today.
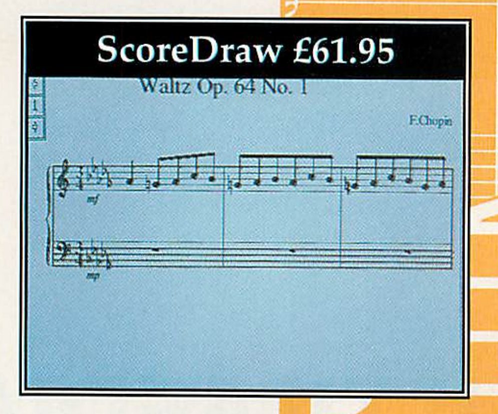


Vox Box is a supporting package for Rhapsody II and consists of four programs. The first, *Perform,* allows you to play Rhapsody II scores, Armadeus samples and Midi files. You can have a continuous performance of your compositions.

VoxBeat is an application to turn sampled percussion sounds into a useful voice module that provides realistic percussion accompaniment to your scores.

VoxSample converts sound samples into usable Archimedes voices. You control which part of the sample is used to create the voice and you can also define the sound's envelope. The resulting voice module is much smaller than the original sample and sounds much better.

VoxSynth is a more complex application that enables you to digitally synthesise voices for use in the Archimedes. Voices are produced by drawing waveforms or harmonics. You even have a form of FM synthesis available. *VoxSynth* is also useful in the science laboratory as it deals with waveforms, harmonics, FFT and FM synthesis.



ScoreDraw is another support program for Rhapsody II. It produces high quality printout of music scores. Together *Rhapsody II* and *ScoreDraw* form the heart of a complete Archimedes based music publishing package. *ScoreDraw* takes a score from *Rhapsody II,* or the original *Rhapsody,* and converts it into a series of Draw files. The results are of true professional publishing quality – especially when printed on a laser printer.

ScoreDraw has its own library of music symbols and it uses these to construct a high quality score. Any text within the score is converted into user selectable outline fonts, if they are available. An additional user library is also supplied which provides items such as hairpins and grace notes.

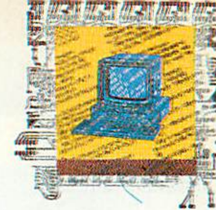
In addition to improved print quality *ScoreDraw* also concentrates more on the formatting of the score. Because the score is handled differently and *ScoreDraw* is not required to 'play' the score it can spend more time on good presentation.

And there's more... Look out for two more music packages coming from the Clares stable soon. And don't forget our Armadeus Sound sampling board if what you are interested in is recording and manipulating sound rather than music.

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Multimedia may be the talk of the town... but what is it exactly? Sarah Burns explains

ABSOLUTE BEGINNERS

Television is great, isn't it? Sit back, enter couch potato mode, and it just happens in front of you. But wouldn't it be nice if TV was interactive and you could actually get involved?

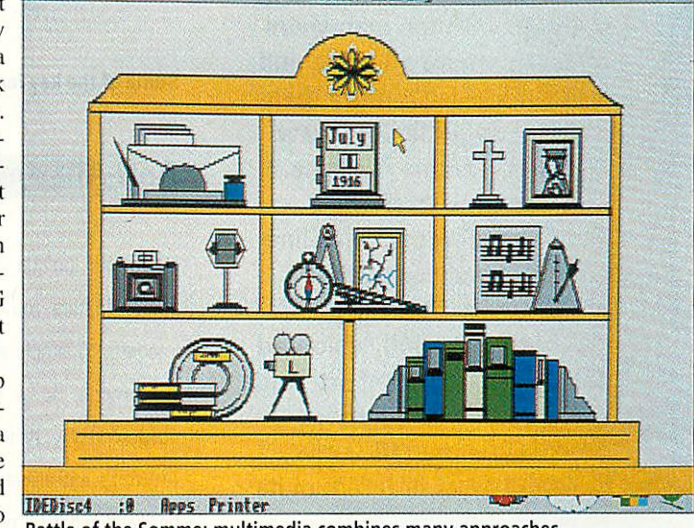
Imagine that TV could do exactly what you wanted. Imagine you could freeze that shot of President Kennedy to delve deeper into the enigma surrounding his murder, or access information slightly related to the Kennedys, like Marilyn Monroe's life story.

Now imagine various forms of media and what they offer, all linked together and controlled by you: pictures on TV, radio interviews, photographs, moving video, animations, newspaper stories, sounds from your stereo. You have just imagined multimedia.

There's no real definition of multimedia but, put simply, it takes a subject and lets the user follow it closely by linking sound, pictures and text through a series of interconnecting windows. Other names for it include interactive TV, infinite virtual address space (catchy), hypermedia and even intelligent TV. But it doesn't stick to one subject; thousands of related matters are instantly accessible, as anything that might cross your mind is likely to have a window. It's like a encyclopaedia, reference book and dictionary rolled into one. The whole program is controlled by you, so the possibilities are endless. It's not necessary to follow any order or sequence, so you can bounce around from one document to another. WUAFIWUG sums up multimedia – what you ask for is what you get.

Pictures and sound take up loads of room in the computer's memory, so multimedia systems usually need to be stored on formats that can hold a lot of data, and are easy to access. The largest hard discs can store a huge amount of information but are very expensive, so most multimedia systems are found on CD-Rom discs. CD-Roms have about 640Mb of memory and are relatively cheap, However they are read-only, so you can't change or program them.

So how do you access all this information? One of the earliest examples of real multimedia was created in the early 1980s by Robert Abel in the United States. He took Picasso's *Guernica* as a centrepiece. He set up a simple multimedia database that allowed the user to explore Picasso's world. The painting appears on screen and using the mouse the user can click on any part of it. Information appears stating what exactly is happening.



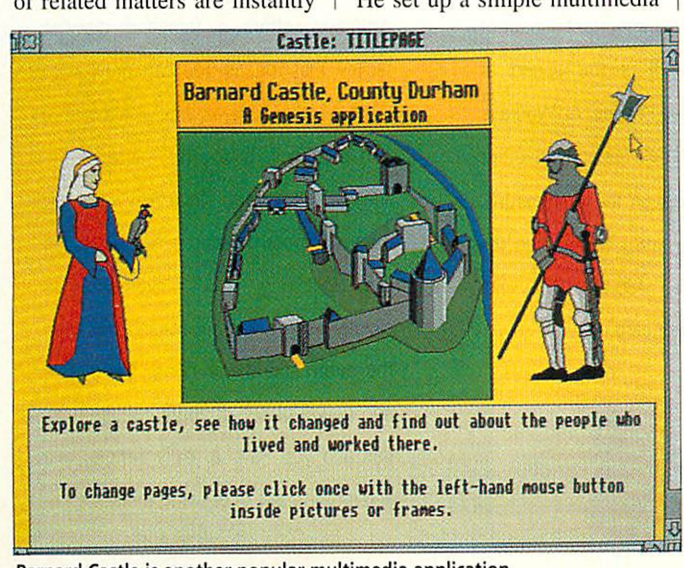
Battle of the Somme: multimedia combines many approaches

Click on Picasso's icon at the top of the screen and a picture of the artist will appear and more icons; you might click on a picture of his house, which could lead on to some text about Spain and the civil war, then select recorded interviews with witnesses from that time or follow another route to discover Picasso's family.

Click on any word to find the dictionary definition. Click on Picasso again to find out who he influenced, then access information about those artists. Multimedia lets you take away your own unique experience. Nothing is prepared for you, so you make your own path.

In the same way *Impression* enables you to make documents and *Draw* produce pictures, there are two programs which allow you to create your own multimedia packages on your Acorn machine – *Genesis* and *Magpie*. Then there are the professional multimedia packages: *The Battle of the Somme*, and *Barnard Castle*, shown on these pages, were produced using *Genesis*. So where does multimedia go from here? Imagine that it is so interactive that you can actually become part of it. The future is already here, as 'virtual reality', which uses computer generated images to make you part of a lifesize virtual environment.

Computer games that use virtual reality allow the player to not only control a character but be it. At the moment 'VR' is in its infancy, and used by the recreational and entertainment industries for interactive fantasy work, but expect it to lap over into other fields . . .



Barnard Castle is another popular multimedia application

HYPERTEXT

Hypertext is one way of looking at multimedia. It has become a rigorously defined way of structuring knowledge. Text can be read in a non-sequential order and expanded as you desire. To move on, you simply click on the text, perhaps on a single word to find out its dictionary definition. It's not necessarily limited to single words so you can select whole sentences and paragraphs and most importantly you can always get back to where you've come from.





ArtWorks is a completely new graphics design and illustration tool for the Archimedes. An object orientated drawing program,with ten man-years of development effort behind it, ArtWorks is far more than a simple evolution of !Draw included with the machine. It can be used to create illustrations from simple line drawings and cartoons to more complex technical illustrations, to fully coloured and shaded works of art. And it can do this faster, more easily and more efficiently than any other program of its type.

Some of the key features include:

Anti-Aliasing display

Using our unique variable WYSIWYG control feature you can vary the screen image from simple and ultra-fast outline only mode, to a fully coloured and shaded display. At the maximum setting ArtWorks anti-aliases all drawings, practically eliminating on screen "jaggies". The effect is similar to having a screen display of several times the actual resolution.

Undo

This single feature is enough to set ArtWorks apart from other drawings programs, because with it you can experiment without risk. You can try something, or even a whole series of operations, and if you don't like the result, undo all the steps one by one back to the beginning. ArtWorks goes further by allowing just about every operation to be undone (and re-done), and by even allowing the undo record to be saved along with the drawing.

THE GRAPHICS

Speed

Just about the most important aspect of any illustration tool is the speed at which it can display images. ArtWorks is typically 2 to 3 times faster than other drawings programs on the Archimedes. It is typically five times faster than the fastest available 486-50 PC with graphics accelerator card.

Freehand drawing

ArtWorks offers a freehand drawing facility that means you can draw with the mouse exactly as you would with a pen or pencil. It doesn't matter if the line isn't very even since ArtWorks will draw a smooth bezier curve along the line, following your movements as closely as you wish. Combine this with the automatic shape filling, the simple and powerful set of curve editing facilities and you have a really simple, fast and intuitive set of drawing tools.

Advert and all illustrations produced entirely in ArtWorks. Separated and output direct from ArtWorks.

Colours and shading

ArtWorks is a full 24-bit colour capable illustration package - it can handle more colours than the eye can see. It offers a unique on-screen colour dithering system to simulate a large number of colour shades, offering over 4000 shades in 16 colour modes and over 100,000 shades in 256 colour modes. This colour dithering system works on all machines even with RISC OS 2.

Two other colour filling tools provide the fastest and easiest possible methods of producing graduated colour fills. Select either the straight graduated fill tool or the radial fill tool, then just click-drag-release. This single operation lets you set the position of the start colour, the direction and extent of the graduation and the position of the end colour. ArtWorks instantly displays the objects filled with a perfectly smooth graduated colour change.

Blending

ArtWorks takes this concept much further than any other graphics program by allowing you to blend between shapes with different numbers of points. You can blend from one shape to another to another etc to create really subtle highlights and colour shading effects. (See the apple and BOSS example illustrations.) On top of this the blends are dynamic, calculated and drawn on-the-fly. This offers two great advantages: a) blends require practically no memory and b) you can edit the shapes that make up the blend and ArtWorks will instantly re-blend using the new shapes.



220 Outline fonts

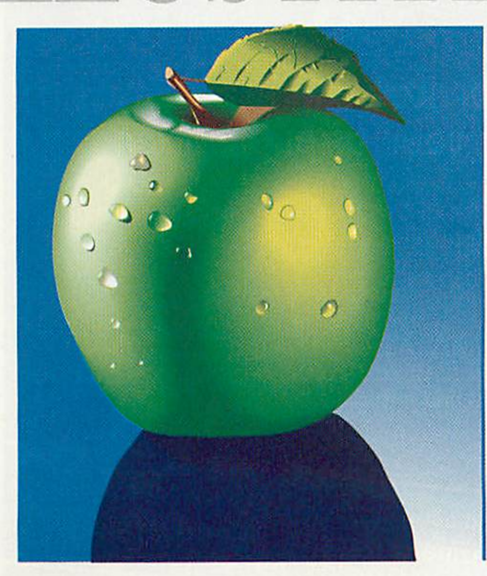
ArtWorks allows text lines to be typed directly on the page, even with the text rotated and shaded with a graduated tint ! It also includes a comprehensive set of text manipulation features such as enveloping, true 3D perspective effects, text around the curve etc. And to complement these facilities the package includes 220 outline fonts, 200 of which are new to the Archimedes. Combine the fonts with the other outstanding ArtWorks features and you have perhaps the best value for money software packages available on any computer.

Review

..it forms what is perhaps the easiest to use, but most advanced graphic illustration package on any personal computer today

ACORN USER April 1992

ILLUSTRATION PROGRAM



Compatibility

ArtWorks is a fully compatible RISC OS multi-tasking application. It can import and export Archimedes Draw and Sprite files as well as files from the leading illustration packages (CorelDRAW, Adobe Illustrator, Aldus Freehand) on other machines.

Review

.Many effects that would take a long time in Draw can be achieved in seconds with ArtWorks

ACORN USER April 1992

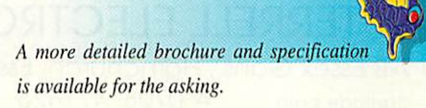
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SHINING EXAMPLES

Are CDs the shiny face of things to come? Paul James looks at a selection of the latest releases

The benefits of CD-Roms are obvious for both supplier and consumer. Supplying up to 640Mb of data and programs on one small disc, a CD is often not much more expensive to produce than a 1Mb floppy. A torrent of CDs is about to rain down, and there is much speculation about the future.

Initially we saw uninspired, but useful, applications of the huge data storage space available. The PC world was awash with newspapers, magazines and technical manuals. We have now begun to see other applications that are more wide-ranging.

It seems as though the number of CD-Rom players connected to Acorn machines has reached a critical threshold. Not only are we seeing more and more Archimedes-specific CD-Roms, but some PC-format CDs deemed potentially popular are receiving specially written Archimedes front ends.

Instead of using the supplied PC interface that will only run under the slow PC Emulator using cumbersome PC-style front ends, the specially written Arc interfaces access the PC-format data on the CD. Text can be read directly and the pictures – stored in Dos format – can be processed as Archimedes sprites. It won't be long before multi-format CDs are released that will run on Mac, PC and Archimedes.

There are several applications that the CD-Rom finds itself being used for. The first and most obvious is the bulk data CD, where the CD is used simply because of its massive storage space.

One example of a very bulky data CD is the Nasa Planetary Data System CD set, consisting of 14 CDs that contain images and other information from the Voyager probes and other space missions. There is no indexing as such: the data is simply divided into sections using directories and descriptive filenames.

Spacetech was the company to write an image-processing package mainly geared to decoding data from these CDs and providing breathtaking views of the planets. There is other data on there, such as the results of experiments conducted by the probes, and this too can be accessed by *PDS-View*, reviewed in *BBC Acorn User* August 1992.

Other bulk data CDs comprise such things as clip art, sound effects, digitised images and music. This type of CD is great for browsing through. It can provide many hours of fun, and, if used in the right circumstances, can be very useful. In fact the most expensive CD in the world, at a staggering £11,000, is a bulk data CD, containing the whole of the Adobe type library, the font system for Macintosh computers.

Somewhat less specialised than the Planetary Data System and one step away from bulk data are the text-based CDs, with perhaps the most foremost example being the newspaper CDs. These basically consist of text, and a few pictures. Articles on specific subjects can be searched for, cross-indexed and printed out.

These CDs demonstrate the basic principle of searching techniques, and how flexible they can or should be. A powerful searching system can make a CD of this type fascinating. One example of this type of disc the *The Sunday Times Election Special*, which contains all of the articles from *The Times* and *The Sunday Times* from January to April 1992. CDs of this type are great resources for libraries, offering far better indexing facilities than that of a physical archive, and of course taking up far less space.

Further removed from bulk data are encyclopaedia or reference CDs, where much data is hidden away behind pretty icons and pictures. This is the area into which most consumer CDs will fall. They can contain books, multimedia applications, training courses, curriculum material and many more types of applications. One such example is the Animated Pixels' *Illustrated Holy Bible*, reviewed here.

Finally come the applications that have flipped over from floppy onto CD-Rom because of the amount of data they can require. The computer game is one example that will do this in the next few years. With 640Mb of storage space, just imagine the sort of epic graphic adventures we may be seeing in the near future. Stereo sound, photographic images, animation and involved story lines may become the consumer equivalent of virtual reality.

Imagine the enthrallment of kids, learning from an educational adventure that seems more like a game to them. We saw *Elite* on the Archimedes, and that didn't even take up 800K of disc space, so think what can be done with 640Mb!



THE REALLY USEFUL CD-ROM

APA Multimedia Ltd
£49
Description: Bulk data – 100Mb of PD and clip art, with some demos

This is an example of what can happen when a CD-Rom is used as a sort of software dumping ground. You'll find many things on this disc. Some of the more useful ones include varied clip art in the form of *Draw* files and sprite files, but there is no cataloguing system of any sort, and it's a case of looking at everything on the disc before you can really know what is on it.

There are a couple of *Genesis* applications, including one for French revision, which could be useful. And there is a lot of public domain software. Again some of this is useful, some not so.

The disc also contains application demos, included as a 'shop window' concept. Demos include 4mation's *Vector* and *Poster* applications, and several screens from Computer Concepts *Artworks* application.

After I looked through this CD and pulled off what I wanted, I had no more use for it. The lack of an indexing system for the clip art means that you have to remember what is on the disc, and most of the art is filed under file names like *1*, or *1_256*, which are hardly helpful.

APA has taken a really unorganised approach, but I have quite a soft spot for it; it gives you the same sort of lucky dip feeling you get from magazine cover discs. I have to admit that you could probably get all of the data and programs contained on this disc from other sources, but that may cost more than the £49 asking price for this CD. However, the lack of an indexing system means that it may just end up sitting on a shelf, with all of the interesting stuff stuck on your hard disc or collection of floppies.

We should see more discs like this; APA is working on *The Really Useful CD-Rom Volume 2*, and a disc called *Woodland*; an educational trip through a forest.

ACORN REPLAY

Acorn Computers Ltd
Free
Description: Bulk data – a sampler for Acorn's Replay

As a taster to its Replay full-motion video system, Acorn has released a free CD entitled the *Acorn Replay CD-Rom*. It contains various clips of moving images, and sound, to show off the capabilities of the Replay system.

Perhaps the best clip of the bunch is that of the space shuttle launch. Many of the clips are rather boring, but this provides a good demonstration of what Replay can do, if not a great example of filming techniques.

REVELATION 2

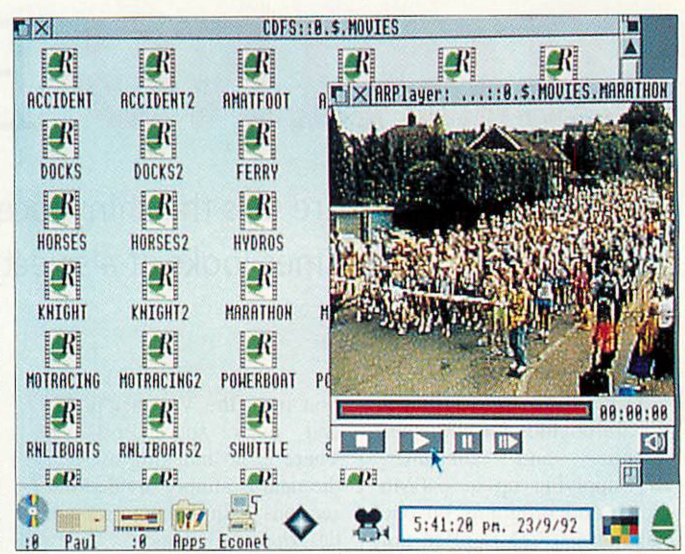
Longman Logotron
£139
Description: Bulk Data – Longman's *Revelation 2* art package, plus hundreds of examples of clip art

This CD-Rom is a bulk data disc that contains clip artwork for use with *Revelation 2*, which is also supplied on the disc with a manual that Longman created using *Magpie*.

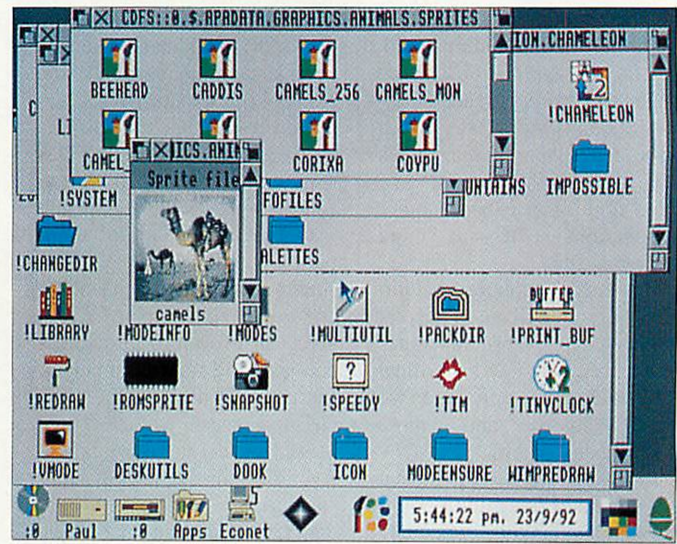
The sprites vary in quality, both of image and subject matter. Perhaps there are a few too many sprites of semi-naked women, or at least women in provocative poses, but much of the clip art is harmless, and would serve well as electronic magazine cuttings in an art room or design studio. There are also directories full of *Revelation* 'Motifs'.

There is no index and the images are structured by directory and file names, which are sometimes misleading. There are a couple of pictures here that have been made up by montaging other images on the CD-Rom, and I don't know why Longman Logotron didn't extend this idea and have an easy-to-use pictorial index.

This is a little pricey, and if you already have the *Revelation* package, it's not for you, but I hope we see more CD-Roms of this ilk. A clip art disc consisting of just a collection of scanned sprites at a price of, say, £50 would probably prove an immensely popular product.



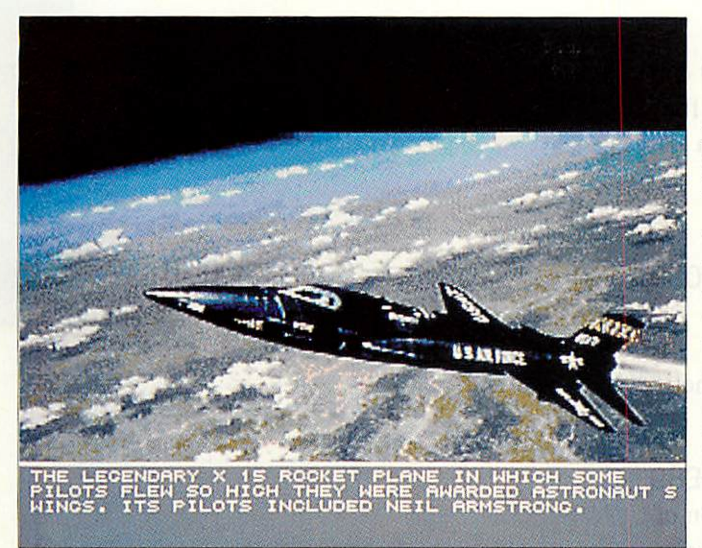
The Acorn Replay CD contains many film clips. With the Arm movie viewer application you can watch and listen to the shuttle blasting off, or the start of a marathon



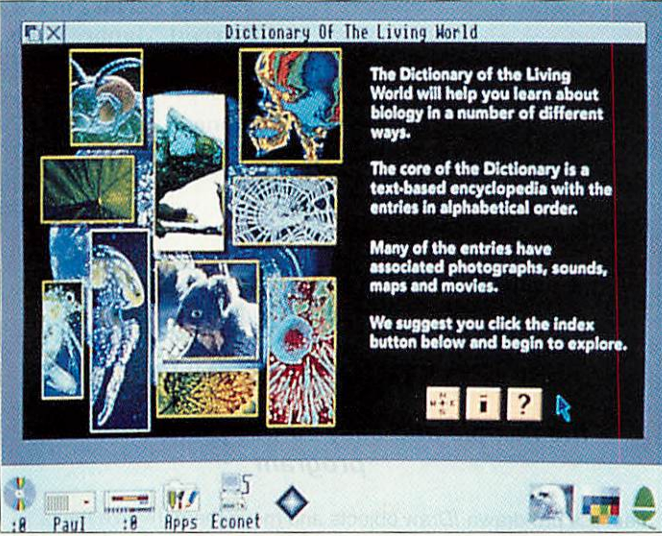
The Really Useful CD-Rom disc is a great idea. It contains hundreds of files including clip art and sound samples. There aren't many CDs like this around at the moment, but hopefully that will change



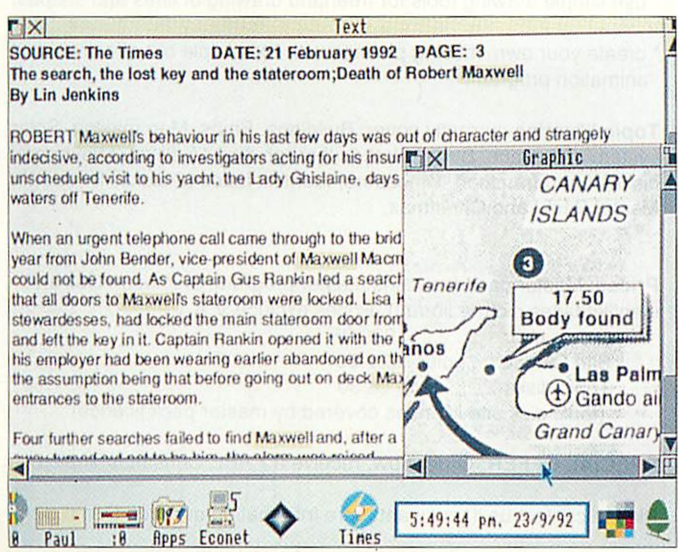
CDs are perfect for storing lots of graphics. Longman Logotron's Revelation 2 CD contains the application itself, alongside many clip graphics files. It's great for experimenting with digitised images



Animated Pixels is writing an Archimedes front end for its PC-format CDs. The Space Encyclopedia is set to become a Risc OS CD, offering Replay movies and sound



The Dictionary of the Living World is a CD containing various information about the animals of the world. It's a very good looking application, with lots of digitised pictures, and sound, but is expensive



Generic CD applications are still popular and great fun. The Sunday Times CD offers all of the articles from the newspaper over a period of time. Digitised pictures and captions are also available

GUINNESS DISC OF RECORDS

Brittanica Software
£58
Description: Textual

This is a CD that probably won't see an Archimedes front end, and will have to be used under the PC Emulator. Nevertheless, if you can endure the inherent slowness it's good fun. However, since the book is about one-sixth of the disc price, many people may find that it is almost as good value as the disc.

ANIMATED PIXELS

The Illustrated Holy Bible, The Illustrated Works of Shakespeare, Sherlock Holmes, The Space Encyclopaedia
£23, except The Space Encyclopaedia, at £57
Description: Encyclopaedia – good reference CDs

This range of CDs, from a company calling itself Animated Pixels, is made up of reference CDs. They are all PC format CDs, but what Pixels has done is to produce an Archimedes front end, so that the PC emulator doesn't have to be used.

Each package has the same feel, simple and easy to operate, with pretty and atmospheric icons. Books are requested off the 'shelf', and the text can be browsed through at your leisure.

The *Illustrated Holy Bible* contains all of the text from both old and new testament, with a few pictures. The *Sherlock Holmes* disc contains all of Conan Doyle's Holmes stories; and Shakespeare's entire works on CD for £23 would certainly be useful in a drama or English class.

The big question is; would you prefer a book? You certainly would get less eye strain, but the CDs are only £23 ex VAT each – in the case of *Sherlock Holmes* and *Shakespeare*, this represents amazing value – and all would make a good addition to any library, whether at home or in school. Let's hope we see more from the same stable.

The Risc OS version of the *Space Encyclopaedia* was a CD not available at the time of review, although the finished CD is up for special treatment, and will receive Acorn Replay movie clips and sound tracks. Judging from the PC version, at £57 this CD is about the right price to appeal to a space enthusiast, or for it to be used as a reference tool in a library.

DICTIONARY OF THE LIVING WORLD

Media Design Interactive
£175
Description: Encyclopaedia – biology database.

The Living World is an example of a CD that has got its presentation right, but the contents are sadly lacking. It looks very good and is initially very inviting, but once you've seen all the Replay clips, heard all the sound and seen all of the pictures, it becomes dull, as there isn't that much in the way of text to keep things interesting. It's very expensive too. Read the full review in *BAU* September 1992.

THE SUNDAY TIMES

The Times Network Systems
£195 per year
Description: Textual – newspapers on CD-Roms

This is a great CD. Once again it's in Dos format, but an Archimedes front end has been written. It's fascinating typing a random word into the search box and browsing through the articles that ensue. This CD is received by subscription and, at £195 per year, the home user may find it more economic to visit the local library, but every school library should have a copy of this.

Incidentally, I'm not being partisan towards News International, it's simply that *The Times* was the newspaper CD-Rom I received for review. The same comments as above apply to all the others.

The equally excellent *Independent* CD-Rom is £299 per year, and includes scanned images of all of the front pages so that you can browse through the headlines.

The Guardian is a snip at £195, but let's hope that its search routines compensate for the notorious misprints.

LISTEN IN

You may not realise that a CD-Rom drive is also perfectly capable of playing normal audio CDs.

Among the CD utilities provided with a CD-Rom player, you'll find an application that will provide control over a standard audio CD, allowing you to shift through tracks, pause, stop and play an audio CD. This utility can turn your Archimedes into a multitasking stereo.

If you're thinking of investing in a normal CD player, why not consider buying a CD-Rom drive kit for your Arc instead? Connected to your stereo, it means you really can have your cake and eat it.

CONCLUSION

There is certainly lots to look forward to in the next few months, so keep reading *BBC Acorn User* for reviews of up and coming CDs.

CDs to expect include the *Hutchinsons Encyclopaedia* from Pep Associates. This well known reference work contains many articles on British life, and also many biographies. It includes pictures, and with excellent searching and browsing techniques looks like it's set to become my favourite CD; it's good looking, easy to use, and pretty comprehensive. Look out for a full review shortly.

British Birds is coming soon from the same people that produced *Living World*, Media Design Interactive. I expect this CD to be very good. MDI got it right with their presentation last time, and the subject matter for this CD is far less ambitious than that of the *Dictionary of the Living World*. This CD should be a bird watcher's dream. Let's hope they get the pricing right.

From the same company comes *Creepy Crawlies*, a database of some of the nastier animals, and *Grooves*, a selection of jukebox tunes.

Karaoke Macbeth is a CD that sounds fascinating, I've not seen a pre-release, but from its title you can guess at its contents. *Frontier 2000* is a CD soon to be released from CIE which looks promising – watch out for a review of both of these shortly.

CD-Rom is a phenomenon that will keep on growing. Very soon players will be wholly affordable, and CD-Roms themselves will be exciting and well-presented slices of knowledge. So far, in the Archimedes market, the *Hutchinsons Encyclopedia* looks set to be a milestone, since it gets it right on all counts, with presentation, content and searching facilities.

MDI is a company to watch, with excellent presentation. With a more stringent approach to subject matter, it could do wonders.

The immediate future of the CD looks rosy. Here at *BAU* we will continue to review forthcoming releases on this exciting media.

ACORN REPLAY

Another recent development that will no doubt play a large part in CD-Rom applications is Acorn Replay. Basically, Replay is a routine that will compress moving video and sound, and provide fast decompression, which means that the data can be read back off of the CD and animated without any pauses or jerks.

The compression factor works in two ways, offering more economic file sizes, and allowing the computer to 'buffer' the next few seconds of video so that more data can be read into memory, allowing smooth motion.

Replay is certainly an astounding achievement that can be used to give CDs a lot of extended interest. After all which would you rather see, a still picture of a space shuttle on the launch pad, or a minute of video showing it blasting off into the sky with a deafening roar?

CD-ROM CONTACTS

Cumana: (0483) 503121
Optech: (0252) 714340
Oak Solutions: (0274) 620423
Acorn Computers: (0223) 245200
Animated Pixels: (0705) 291866
APA Multimedia: (0634) 295222
Longman: (0223) 425558
Times Network: 071-782 7143

For a round up of available SCSI cards turn to *BBC Acorn User* September 1992.

If you have any questions about CD Rom then why not send in a letter to Questions and Answers?

WHICH HARDWARE?

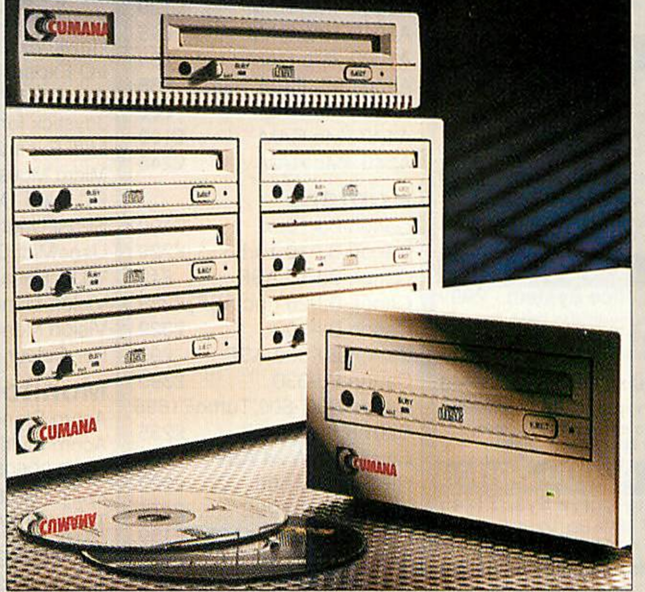
Having decided that you want to buy a CD-Rom drive, the cost will be about £370. Add around £120 for the SCSI expansion card if you haven't got one, and then add VAT if you have to, and the total is how much it will cost you at the moment.

CD-Rom players are all much the same, and the only thing that will change about them in the near future is the speed and the price. The former will rise, and the latter fall. At the moment a CD player can suck around 150K of continuous data from the CD surface, nowhere near the speed of a hard drive, but things are improving.

If you already have a SCSI card, and want to add a CD-Rom player, then you'll probably need to upgrade your card to include software that will control the player. This software takes the form of a small Rom chip that can be purchased and simply plugged onto the card, replacing the old Rom. Typically, this new Rom costs around £50. Check your old card doesn't have the CD filing system present on your SCSI card by pressing F12 and typing *HELP CDFS. A report of 'No Help Found' indicates that there is no CD filing system.



Oak Solutions offer two drives, one fast and one slow



Cumana, the most active supplier in the market, offer several drives

Opening Hours Monday-Saturday 10.00 to 18.00

QuickShow £25+VAT

!QuickShow

Video Titling

&

Slide Show Presentation

Has never been easier!

QuickShow is an easy to use slide show presentation and video titling package. It allows you to create a sequence of frames containing text of any colour with drop shadows, outline shadows and rubout boxes using outline fonts. Sprites can also be included in frames and positioned and resized as necessary. Once several screens have been created they can be linked together with the sequencer which allows you to fade each screen out and in with the many fades provided with the package. Completed sequences can be converted to a stand alone application which when run, automatically 'Shows' the sequence without using !QuickShow.

Flopticals / CD-ROM / Tape Streamers

A3000/A5000/A300/A400 External Floptical (without SCSI card)	£399
A5000 Internal Floptical kit (with Econet SCSI card)	£359
Floptical floppies (20Mb)	£20

Each of the above systems comes complete with one floptical floppy.

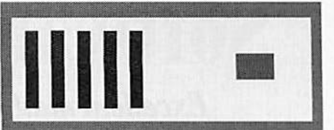
Cumana CD-ROM Combi Pack £699

Comprises CD-ROM drive, SCSI card, stereo speakers, 6 RISCOS CD-ROM titles, The Hutchinson Encyclopedia, Dictionary of the Living World, Revelation 2, The Illustrated Holy Bible, The Illustrated Works of Shakespeare, Sherlock Holmes on a Disc, !CDPlayer, 3 caddies, etc.

150Mb Tape Streamer (without SCSI card) £399

Our Tape Streamers are housed in attractive case with power supply and fan and are suitable for any Acorn RISCOS computer (however they must be used with an Acorn compliant SCSI card). They come complete with one data cartridge and Morley's SAS (Safe and Sound) tape backup software.

Hard Discs



IDE

The following are complete HardDisc Systems comprising of IDE disc controller, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal	
40Mb 17ms	£210
105Mb 17ms Cache	£305
125Mb 16ms Cache	£359
200Mb 13ms Cache	£499
330Mb 12ms Cache	£749
520Mb 12ms Cache	£999
A5000 Exchange Drives	
120Mb 16ms Cache	£200
200Mb 13ms Cache	£350
A3000/Archi External	
40Mb 17ms	£299
105Mb 17ms Cache	£399
125Mb 16ms Cache	£455
200Mb 13ms Cache	£599
330Mb 12ms Cache	£849
520Mb 12ms Cache	£1089
A3000 Hard Cards	
30Mb Internal	£249
45Mb External	£399
100Mb External	£499
IDE Hard Disc Interface	
IDE Controller	£69

Please ring for further details.

SCSI

The following are complete SCSI HardDisc Systems comprising of a Morley SCSI interface, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal	
105Mb 18ms Cache	£429
180Mb 18ms Cache	£599
330Mb 12ms Cache	£899
520Mb 12ms Cache	£1049
A3000/A300/A400 External	
105Mb 18ms Cache	£509
180Mb 18ms Cache	£699
330Mb 12ms Cache	£979
520Mb 12ms Cache	£1149
Removable Hard Discs	
44Mb (Inc one cartridge)	£499
44Mb Cartridge	£55
88Mb (Inc one cartridge)	£599
88Mb Cartridge	£99

The above are external units

SCSI Controller Cards	
Morley Uncached	£139
Morley Cached	£189

Archimedes, A3000, A5000 Software

Applications

3D Construction Kit (Domark)	£38
ABC Compiler (Oak)	£77
Alphabase (Clares)	£37
Ancestry (Minerva)	£59
ANSI C v.3 (Acorn)	£125
Arc DFS (Dabs)	£22
ArcComm2 (Logotron)	£52
ArcLight (Ace)	£40
ArcTerm 7 (Serial Port)	£62
Arcticulate (4D)	£20
Arctist (4D)	£20
Armadeus (Clares)	£59
Artisan 2 (Clares)	£43
Art Works (CC)	**£149**
Atelier (Minerva)	£69
Autosketch v2 (Autodesk)	£65
Cable News (Lingenuity)	£165
CADet (Minerva)	£139
Chameleon 2 (4Mation)	£35
Compression (CC)	£39
Control Panel (Lingenuity)	£14
DataVision (Silicon)	£110
Desktop Assembler (Acorn)	£125
Desktop C (Acorn)	£185
Desktop Office (Minerva)	£95
Desktop Publisher (Acorn)	£125
Desktop Thesaurus (RISC Dev)	**£19**
Draw Print-Plot (Oak)	£39
Easiword (Minerva)	£29
Easy Writer II (Icon Tech)	£126
Einstein (Ace)	£106
Equasor (CC)	£39
Euclid 2 (Ace)	£50
Eureka (Longman)	**£109**
Film-Maker (Silicon)	£71
Financial Accountant (Silicon)	£203
First Word Plus v2 (Acorn)	£67
Font FX (DataStore)	£9
Font Starter Pack (Acorn)	£35
Gammaplot (Minerva)	£36
Genesis 2 (Oak Solutions)	£109
Graphbox v2 (Minerva)	£57
Graphbox Pro (Minerva)	£109
Hard Disc Companion II(Beebug)	£45
Hearsay II (Beebug)	£70
Hotlink Presenter (Lingenuity)	£41
Home Accounts (Minerva)	£34
Illusionist (Clares)	£76
Impression v2 (CC)	**£125**
Impression Junior (CC)	£75
Impression Bus Supp (CC)	£39
Inter-Chart (CC)	£20
Inter-Sheet II (CC)	£30

Inter-Word (CC)	£30
Investigator v2 (Serial Port)	£22
ISO Pascal Rel.2 (Acorn)	£83
Mailshot (Minerva)	£29
MasterFile II (Beebug)	£20
MegaUtils (Desktop Projects)	**£10**
Midnight Express (Mid. Graph.)	**£49**
Mogul (Ace)	£20
Multi FS (Arxe Systems)	£27
Multistore v2 (Minerva)	£219
Notate (Longman)	£54
Office Tools (Silicon)	£276
Ovation (Beebug)	£95
PC Access (Minerva)	£29
PCB (Oak)	£99
PC Emulator (Acorn)	£95
Pin Point (Logotron)	£79
PipeDream 4 (Colton)	£179
Poster (4Mation)	£75
Presentation System (Silicon)	£61
Presenter 2 Hotlink (Lingenuity)	£33
Presenter GTi (Ling)	£66
Printer JX, PJ, CA (ACE)	£13
Pro Artisan (Clares)	£75
Realtime Solids Modeller (Sil)	£99
Render Bender v2 (Clares)	£99
Revelation II (Logotron)	£110
Rhapsody v2 (Clares)	£45
RISCBasic (Silicon)	£112
RISCType (CIS)	£16
Schema (Clares)	£96
SigmaSheet (Minerva)	£38
ShapeFX (Datastore)	£9
ShowPage (CC)	£130
SmArt (4Mation)	£50
SmArtFiler (4Mation)	£32
Snippet (4Mation)	£26
Solid CAD (Sil Vis)	£115
Speech! (Superior)	£15
Splice (Ace)	£22
Squirrel Database (Dig Serv)	**£125**
Super-Dump (Silicon)	£21
Super-Plot (Silicon)	£28
Studio 24+ (EMR)	£150
Tiler (Desktop Projects)	**£10**
Titler (Clares)	**£120**
Toolkit Plus (Clares)	£36
Tracker (Serial Port)	£37
Tween (Ace)	£22
TypeStudio (Beebug)	**£43**
Vector (4Mation)	**£75**
Vox Box (Clares)	£47
Worra CAD (Oak)	£83

Games

Aggressor (Atomic)	£18
Air Supremacy (Superior)	£17
Alien Invasion (Dabs)	£14
Aliped (Dabs)	£12
Ballarena (Eterna)	£14
Bambuzle (Arxe Systems)	£19
Battle Tank (Minerva)	£13
Black Angel (4D)	**£26**
Blaston (Eterna)	£15
Blitz (Arxe Systems)	£17
Blowpipe (Eclipse)	£15
Bobby Blockhead (Atomic)	£18
Boogie Buggy (4D)	£20
Break 147 & Superpool (4D)	£26
Bubble Fair (Eterna)	£14
Bug Hunt, MoonDash (Min)	£13
Bug Hunt in Space (Minerva)	£13
Cartoon Line (Eterna)	£19
Casino (Minerva)	£18
Cataclysm (4D)	£20
Caverns (Minerva)	£14
Chequered Flag (CIS)	£19
Chess 3D (Micro Power)	£14
Chocks Away 2 (4D)	£20
Chocks Away Extra Miss(4D)	£15
Chocks 2 Compendium (4D)	£30
Chopper Force (4D)	£POA
Chuck Rock (Krisalis)	£19
Colony Rescue (Dabs)	£12
Conqueror (Superior)	£18
Crisis (CIS)	£15
Cyber Chess (4D)	**£39**
Dreadnoughts (Turcan)	**£26**
Drop Ship (4D)	£16
Elite (Hybrid)	£32
Enter the Realm (4D)	£20
E-Type Compendium (4D)	£20
Family Favourites (Minerva)	£15
Fire Ball 2 Xtra (CIS)	£12
Freddys Folly (Minerva)	£13
GODS (Krisalis)	**£19**
Grievous Bodily 'ARM (4D)	£20
HoverBod (Minerva)	£13
Holed Out Compendium (4D)	£20
Hostages (Superior)	£14
Ibix the Viking (Minerva)	£14
Iron Lord (Cygnus)	£14
James Pond (Krisalis)	**£19**
Jet Fighter (Minerva)	£13
Karma (Periscope)	£22
Kerbang (Eterna)	£15
Krisalis Collection	**£22**
Last Ninja (Suoerior)	**£19**

Legend of the Lost Temp (Eter.)	**£19**
Lemmings (Krisalis)	£19
Loopz (Audiogenic)	£18
Lotus Turbo Challenge II (Kris)	**£19**
Maddingly Hall (Minerva)	£13
Mad Prof Mariarty (Krisalis)	£15
Mag Scrolls Collection 1	£26
Mah-Jong Patience (CIS)	£15
Mah-Jong The Game (CIS)	£18
Man United Europe (Krisalis)	£19
Master Break (Superior)	£15
Micro Drive World Edition (CIS)	£24
MIG 29 Super Fulcrum (Domark)	£32
Minotaur (Minerva)	£14
Missile Control (Minerva)	£14
Nebulus (Krisalis)	**£19**
Nevryon (4D)	£15
Oh No More Lemmings (Kris)	**£16**
Omar Sharif's Bridge (Krisalis)	**£22**
Orion (`Minerva)	£14
Pacmania(Domark)	£17
Pandora's Box (4D)	£20
Pesky Muskrats (Coin-Age)	**£19**
PipeMania (Ent. Int.)	£18
Poizone (Eterna)	£14
Populus (Krisalis)	**£22**
Powerband (4D)	£20
Quest for Gold (Krisalis)	**£19**
Repton 3 (Superior)	£15
Rockfall (Eterna)	£16
Rotor (Arcana)	£19
Real McCoy 1/2 (4D) (ea.)	£24
Saloon Cars (4D)	£20
Saloon Cars Deluxe (4D)	**£28**
Saloon Cars Del Extra Courses	**£16**
Sim City (Krisalis)	**£22**
Sporting Triangles (CDS)	£19
Starch (Dabs press)	£12
Superior Golf (Superior)	£15
Sup Golf Extra Courses (Superior)	£14
SWIV (Krisalis)	**£19**
Tactic (Eterna)	£15
Talisman (Minerva)	£12
ThunderMonk (Minerva)	£14
Top Banana (HEX)	£19
Tower Of Babel (Cygnus)	£18
Trivial Pursuit (Domark)	£22
Twin World (Cygnus)	£14
Waterloo (Turcan)	**£19**
Wonderland (Virgin)	£25
X-FIRE (4D)	**£20**
Zarch (Superior)	£15
Zelanites (Micro Power)	£18

Education

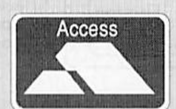
Adv. Playground 5+ (Storm)	£17
Amazing Ollie 4+ (Storm)	£14
Coffee 9+ (Storm)	£28
Concept Designer (Logotron)	£23
Converta-Key	£15
Crossword+ 8+	£19
Data Word (Triple R)	£15
Desktop Folio (ESM)	£82
Farmer Giles 2 (CTS)	£17
First Words & Pictures (Chk)	£26
Flight Path 9+ (Storm)	£28
Freddy Teddy (Topologika)	£19
Freddy Teddy's Adv (Topol.)	£17
Fun & Games 5-9	£18
Fun School 2 (Database)	£15
Fun School 3 (Database)	**£18**
Fun School 4 (Database)	**£18**
(Please spec. age group <5, 5-7, >7)	
Giant Killer (Topologika)	£17
Giant Killer Support (Top)	£14
History Costume Pk (Mic St)	£17
House of Numbers (Chalk)	£19
Hyperbook Reader (Logotron)	£48
Hyperbook Lib (Logotron)	£110
Junior Database (Iota)	£40
Kiddicad (Oak Sol.)	£83
Letters and Pictures (Chalk)	£18
Logo (Logotron)	£60
Magpie (Logotron)	**£45**
Maps & Landsc. 1/2 (Chk) ea.	£19
Money Matters (Triple R)	£20
Numbers and Pictures (Chalk)	£18
Numerator (Logotron)	£60
Numerator Chaos (Logotron)	£19
Ollie Octupus Sk Pad (Storm)	£14
Pendown (Logotron)	£50
Pendown Fonts (Logotron)	£17
PIPP (CIS)	£30
Picture Book (Triple R)	£20
Pin Point Junior (Logotron)	**£24**
Pirate (Chalk)	£18
Prime Art (Minerva)	£69
Puncman 1-2,3-4,5-7 (Chalk) ea.	£18
Reversals (Chalk)	£18
Search & Rescue 9+	£28
Spellbook 4-9 (Soft Stuff (SS))	£19
Star (Logotron)	£16
Target Maths (Triple R)	£20
Things to do with No's (SS)	£19
Things to do with Words (SS)	£19
Words and Pictures (Chalk)	£18
World Scape (Eclipse)	£15
Please call for titles not listed	

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Please contact us if you are offered a better price elsewhere, we will do our best to match it. We operate the Acorn Teachers Scheme & 0% Finance Schemes. This document was produced entirely on the Archimedes using Impression, ArtWorks, Draw & Paint.

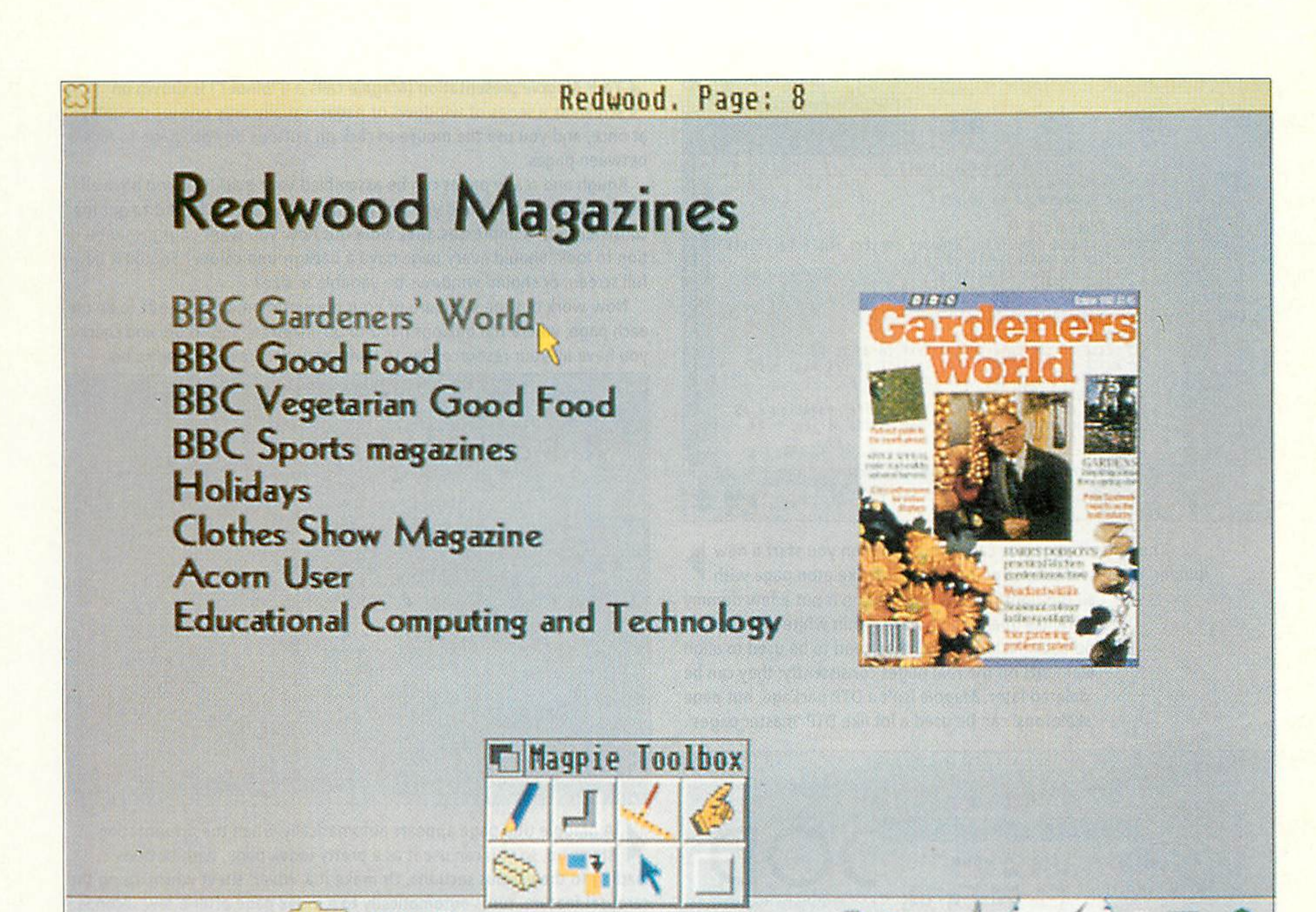








NOV 92



MASTERING MAGPIE

Can multimedia really be this easy? Is desktop video just a step around the corner? Graham Bell creates a complete Magpie presentation

Since *Genesis Plus* is bundled with all Learning Curve packages and *Magpie* is proving popular in schools, a large proportion of Archimedes users have access to a hypertext authoring package.

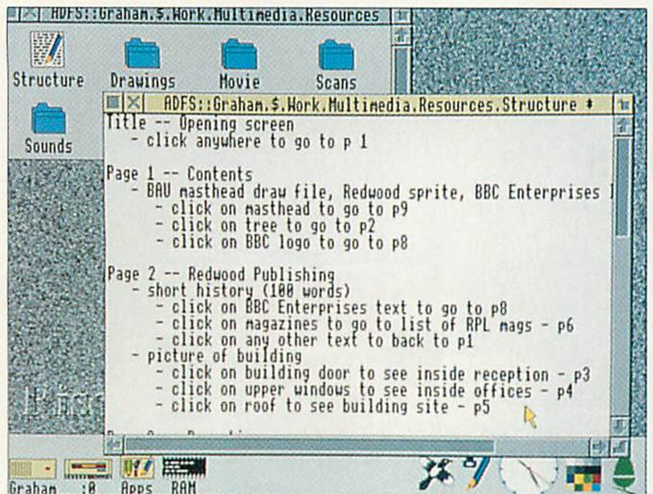
But reading the reams of magazine punditry suggests two things – first that it's vital to have an upmarket machine with mips and megs aplenty, and second that you need every frame-grabber, scanner and sampler known to man plus, of course, a really *big* desktop. But what can be done with modest hardware?

Putting together a small presentation using *Magpie* and giving information about *Acorn User* turned out to be relatively easy. The complete working presentation can be seen on the stands at the *BAU* show. *Magpie* presentations take the form of a 'binder', like a loose-leaf book, with pages containing items like text, graphics, sounds and so on. The 'pages' can be linked together in any order using 'buttons'.

There can be several buttons per page, each jumping somewhere different: there isn't a preset 'page order' in the binder, and it is not intended to be read like a book, from front to back. With the latest version of *Magpie* you can even include Replay moving video: anyone with a video camera can tape their own material and send it off to a Replay compression centre such as Uniqueway, (0222) 644611, the company we used in this example. We also used an Irlam ProImage scanner and an Oak Recorder to add sound.

The video returns as an ARMovie file on disc, which can be incorporated into a presentation in the same way as drawings, sprites, sound and music files. And if you don't have a scanner, at least one advertiser in *BAU* will also scan photos for you.

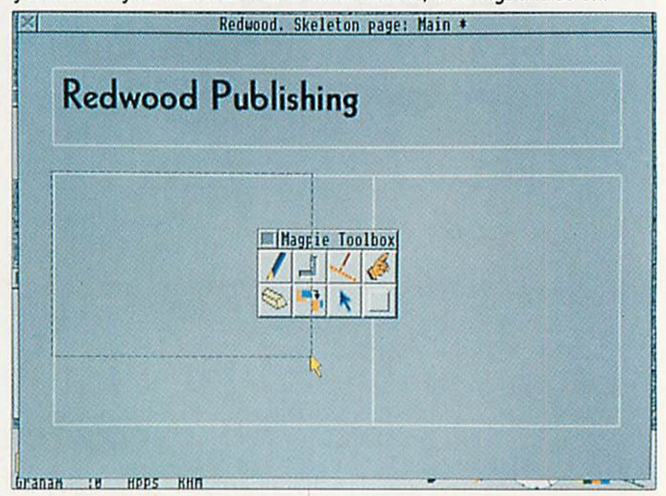
Pre-planning is a good idea. Get together a structure for the presentation, and then you can prepare all the necessary raw materials for your work beforehand: take the photographs, do the scans and samples, draw the diagrams, even write snatches of text,



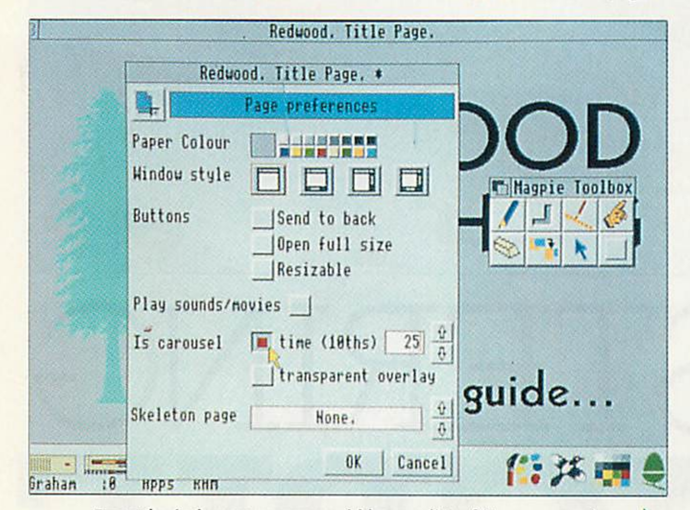
Your *Magpie* presentation (*Magpie* calls it a 'binder') is shown on screen as a series of windows or pages: usually only one is on display at once, and you use the mouse to click on buttons on each page to flick between pages.

Rough and ready pages can be assembled very quickly, if you have all the resources at hand and you know what you want to do. But to get the consistency that impresses, first work out how you want your presentation to look. Should every page have a background colour? Should it be full screen, or should windows be variable in size?

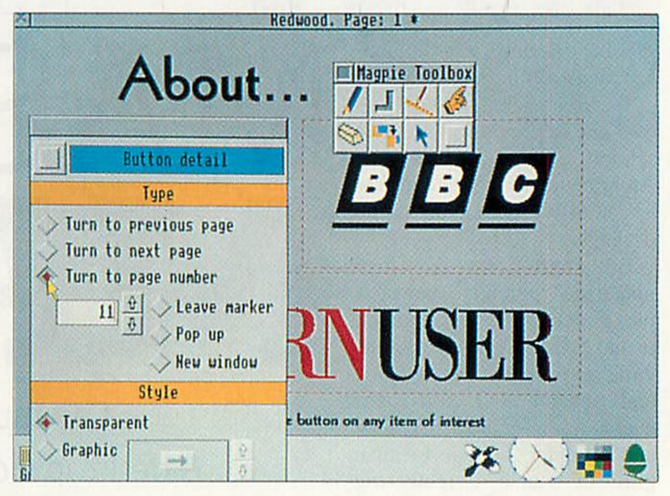
Now work out the structure of your presentation, what needs to be on each page, where the buttons need to be linked to, and so on, and check you have all your resource files to hand: sounds, drawings and so on.



The default page size can be set up when you start a new 'binder' or presentation. You can prepare a skeleton page with all the right preferences, and on it put a few dummy frames (make them have a thin white outline with no background colour) that need to be used to align elements on the real pages consistently; they can be deleted later. *Magpie* isn't a DTP package, but page 'skeletons' can be used a lot like DTP 'master pages'.



A *Magpie* title page appears automatically when the presentation starts up, so you can use it as a pretty index page, with buttons leading to the various sections. Or make it a 'cover' sheet which, using the carousel feature, turns automatically to a index page after a few seconds. The carousel needs a button to tell it where it has to turn to, but you can make it transparent and responsive to neither a mouse click or keypress.



From the index page, you could have a list of items, or perhaps icons, as here. Each illustration is covered by a transparent button which leads to the start of that section of the *Magpie* binder. It's a good idea to have a familiar icon on this page, which is repeated elsewhere in the presentation: clicking on the copies should lead back to this 'home page'. Though you can jump immediately to any individual page, *Magpie*'s own contents display is a fairly unfriendly way of navigating through a document, because pages can have only numbers, not names.

then put all the files somewhere handy. Work out what goes on each page and where the main buttons need to lead the user.

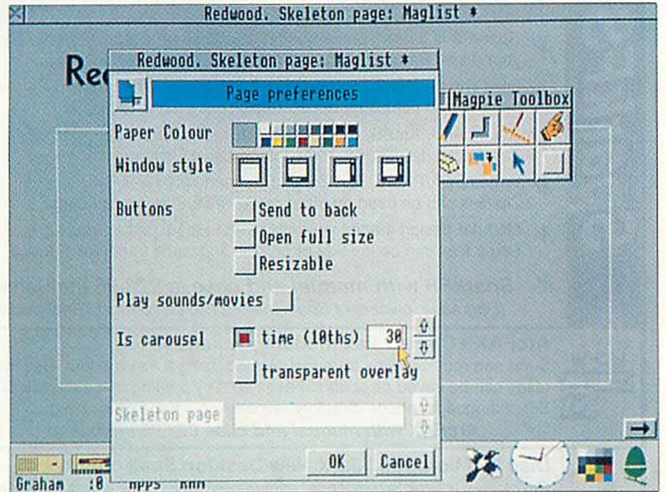
The plan for this presentation called for it to be split into three parts: a section on Redwood Publishing, a section on BBC Enterprises, which is Redwood's parent company, and a section on *BBC Acorn User* and its hardworking and devoted staff. *Magpie* allows presentations to be split into named sections, with pages inserted into each section independently, so three sections were created from the outset. You don't need to create the pages in their final order: if you move them around, all the links between pages are updated properly.

Magpie's own contents page system, while good for editing, is not really suited to browsing by novice users, and by using a title page it can be bypassed. A new feature of the latest *Magpie* means that window scroll bars can be removed, so the presentation window covers the whole screen and there are fewer distractions.

The presentation contains a number of full-colour scanned photographs: it's intended to be viewed in mode 28 to get the best out of 256-colour scanned sprites. Go into the mode you want before creating the new binder file, as you can then choose 'full screen' as the default page size.

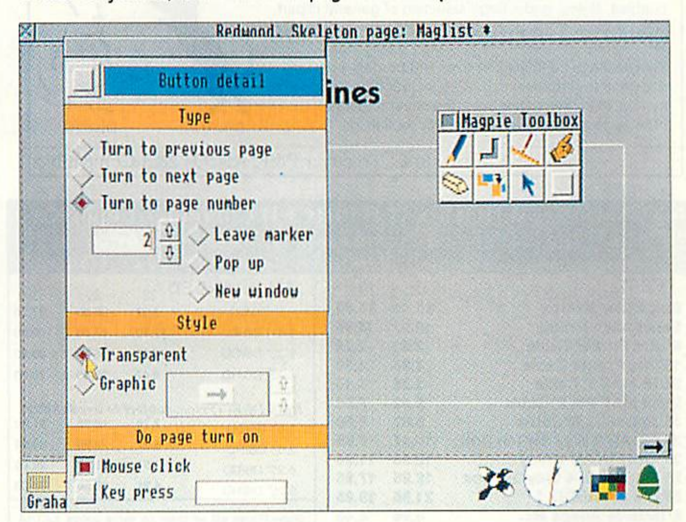
A lot of professional presentations carry something like a company logo on each page. If you want anything like this, then *Magpie*'s skeleton pages are the best way: data on the skeleton page is shared by all the pages, not stored separately for every page.

Changing the skeleton page later affects all the real pages containing the skeleton item. However, you can still alter or delete skeleton items directly on each real page as well. It

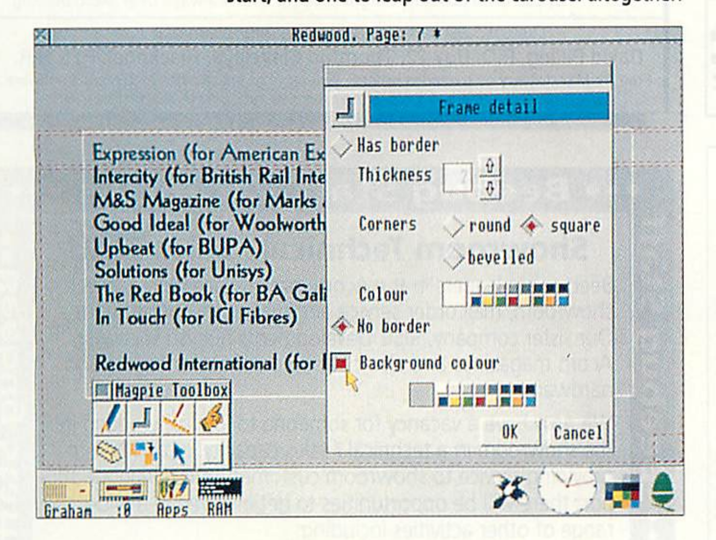


Getting out of a carousel can be difficult – you may have to wait until the whole sequence ends, even if you've seen enough. To avoid the frustration, it's best to provide a way of jumping out of the whole carousel. The best way is a transparent button covering the whole page, which turns to a specific page number. A 'turn to next' button takes precedence over a 'turn to x', so the automatic carousel continues unaffected until you click the mouse. A way out is also vital if you want the carousel to loop: the last page needs two 'turn to x' buttons, one to return to the carousel start, and one to leap out of the carousel altogether.

A carousel isn't just for showing a sequence of pictures. It can be used to show more information than fits on one screen – for example, a really long list. For a list, like this catalogue of magazines, arrange a skeleton page, with the page heading on it, and a box for the text. Also on the skeleton put a button which turns to the next page. Make it transparent and responsive to neither mouse click nor keypress – so whatever you do, it will turn the page after the preset time.



Now base each of the real pages on the skeleton, then type in the text for part of the list. Because the features of the skeleton are duplicated on each page, the carousel will automatically turn on to the next part of the list. If the only way 'in' to the carousel is at the beginning (no buttons jump into the middle of the sequence), you can delete the page heading off all but the first page, then make every succeeding page a transparent overlay. This reduces flickering as the pages turn. But do make sure the main text box has a background colour, so it erases the text on the previous page.



Carousel sequences can get complex, with buttons leading to forks in the sequence or to short side branches. A button on the list of magazines leads to an extra page which has a scanned magazine cover. That page is a transparent overlay, so in effect it appears next to the magazine name. And the magazine cover page carousels back automatically, so the cover disappears. The list page then itself carousels on.

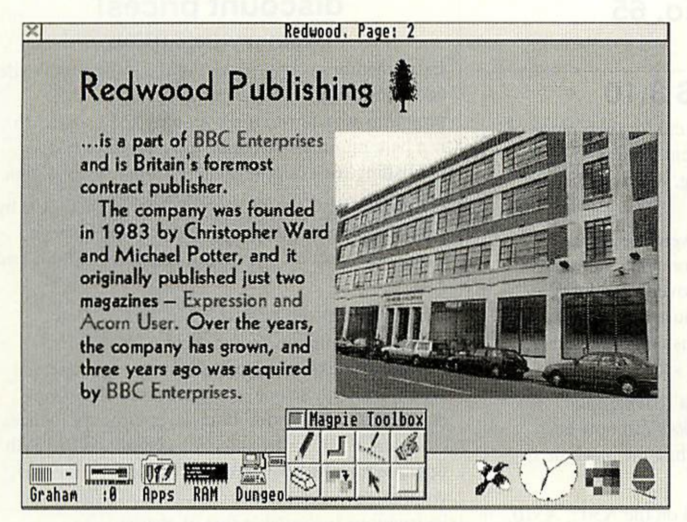
can be a good idea to put a couple of guide frames on the skeleton page as well, to help position regular items on the main pages.

Skeleton pages are natural for carousels too (carousels are pages which automatically jump to the next page without the need for a click on a button). A skeleton can be used to set up constant items for the carousel – for example, you could have a series of pictures accompanied by a bit of text which always stays the same. Less obviously, the buttons on a series of carousel pages can be drawn from the skeleton page too.

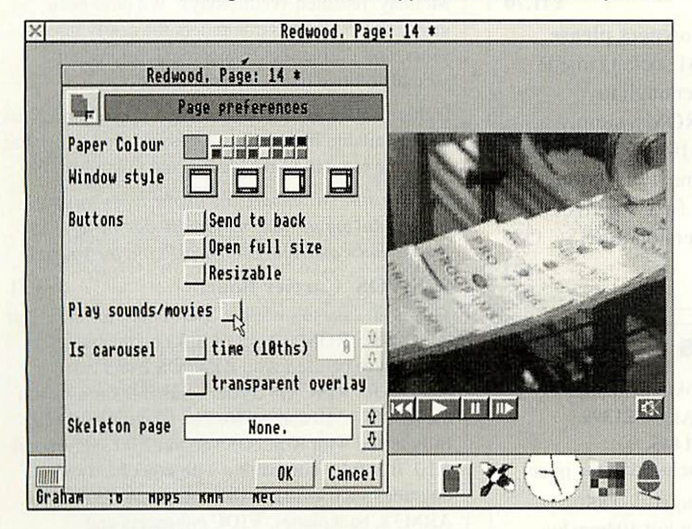
In some circumstances, the same effect can be obtained without a skeleton page, by setting up the text on the first page of the carousel, then making all the succeeding pages carry only pictures – but as a series of transparent overlays. Each picture will obliterate the previous one, but leave the text showing. This method only works if you make sure the carousel always starts at the beginning.

Using *Magpie* for this presentation, I found I could do *almost* everything I wanted. And the latest *Magpie* features like skeleton pages, carousels and full-screen windows certainly make our *BBC Acorn User* presentation look a little more impressive than it would otherwise have been. Having said that, some of *Magpie*'s editing features remain rudimentary – you can't cut and paste text for example, and aligning items takes ages because there's no grid.

In all, the biggest problem is finding time to do all the necessary work – an hour per page is not a bad estimate of the time it takes to put together a professional-looking presentation using *Magpie*, if you include the time spent generating drawings, scans, writing text and so on.



A section of Replay video has to be professionally compressed from VHS videotape on to disc – Uniqueway compressed this video of Acorn User being printed. The video returns as an ARMovie file, which can be imported on to a Magpie page as easily as a sprite – though file sizes are huge. The !ARMovie application must also be present.



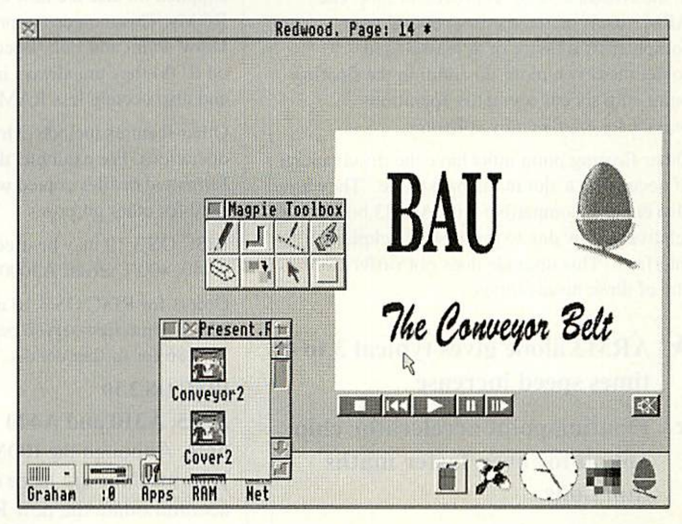
While a movie is playing, nothing else can happen on screen – pressing the Stop button stops the video and allows you to use the normal Magpie buttons to link to other pages.

Magpie doesn't include the Replay data file within the binder file, as it does with drawings and sprites. So you must keep the movie file in the same directory once you've imported it.

You can't change the size of the movie frame, only move it around within the Magpie page. Also, you must specify whether it is to be a high-quality (25 frames per second) or lower quality (12.5fps) movie suitable for Arm2-equipped machines at the time of compression. There are CD-Roms cotaining Replay 'clip-art' if you want to try out the idea – it's impressive.

If you include colour scans in your presentation, you'll find Magpie's facilities very basic. Like all illustrations, there's no way of cropping or fixing the aspect ratio. And 256-colour scans do look very poor in a 16-colour screen mode.

The lesson is to use ChangeFSI or something similar to scale the sprite to the correct size beforehand, and if your presentation will have to be shown in a 16-colour mode, change the mode of the sprite too. Then incorporate the scan on the Magpie page, and don't change the size or shape with the mouse Adjust button.



The control buttons at the foot of the video frame can be used to start, pause, stop and rewind the video sequence. Alternatively, the page preferences can be set up to play the sequence automatically whenever the page is opened.

You could also set the carousel feature to turn to another page just after the Replay video has finished – so you could set up a sequence of pages, each showing one scene of Replay video.



GENESIS OR MAGPIE

Magpie's clear competitor is *Genesis Plus* (and the more advanced *Genesis 2*). Both are authoring and browsing packages for mixed data. Both can display text, drawings and sprites, music and sampled sound files. *Genesis* can incorporate a slightly wider range of data types – *Magpie* can't handle *Euclid 3D* models or *Mogul* animations, for example. And *Magpie*'s text handling was in the past not as flexible as *Genesis*', but it has narrowed the gap with the latest release 1A.

Genesis is considerably more programmable. For example, if you want to ensure two logos will appear at exactly the same position on different pages, you can load and edit the script for those pages and alter the coordinates directly. Alternatively, there is a 'lock to grid' command. With *Magpie*, the options amount to what can be done freehand with the mouse, though carousels are an impressive feature that *Genesis Plus* doesn't currently match.

The resource sharing of *Genesis* is much more sophisticated: any large data files to be shared between pages must be on a skeleton page in *Magpie*. But *Magpie* does compress its data, to produce smaller files without resource sharing.

Overall *Genesis* is certainly more flexible for the knowledgeable user who learns to use its script processing language. However it is no more difficult for the beginner to use. What both need are better ways of cutting and pasting elements between pages, and better colour control; both are limited to the 16 colours in the desktop palette. Both also lack control over the aspect ratio of graphics, as they can get badly distorted.

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The only ARM3 upgrade to allow a floating point accelerator chip to be connected directly to the ARM3's 32-bit coprocessor bus. The ARM3 itself increases the speed of your computer by a factor of at least 3, and sometimes even more. In addition the floating point chip speeds up maths operations previously emulated by software.

Other floating point units have the disadvantage of occupying a slot in the backplane. They are also either incompatible with ARM3 boards, or relatively slow due to the 16-bit backplane interface. This upgrade does not suffer from any of these disadvantages.

- ★ **ARM3 alone gives typical 3 to 4 times speed increase**
- ★ **Floating point accelerator chip option for even faster maths functions**
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RISC OS 3.10

Acorn's new operating system for their range of RISC computers. The current version of RISC OS (2.00) is just 512K long, whereas OS 3.10 contains 2Mb of code.

Many applications which were previously supplied on disc are now contained in the OS ROMs. This includes improved versions of Draw, Paint and Edit. Because they are available on ROM they are always instantly accessible, and also occupy less RAM space.

Other features include extra "background" operations. For example, discs can now be formatted or files copied while the machine is used for other purposes.

RISC OS 3.10 may be used on the A305, A310, A440, 400/1 series, A3000, A540 etc.

Orders for RISC OS 3.10 are now being taken on a first-come first-served basis. Phone 0752 847286 for further details.

RISC OS 3.10 — £41.70

A305, A310 and A440 owners please note. Although the ROM sockets inside your machine are large enough to accommodate the new ROMs, simply plugging in RISC OS 3.10 *will not work.* This problem is overcome by installing the RISC OS Carrier Board first. The RCB may be used with any version of RISC OS.

RISC OS Carrier Board — £21

A5000 systems & memory

A5000 with RISC OS 3, 80Mb hard disc, multisync monitor and ARM3. - **£1399.**
A5000 learning curve. - **£1445.**
Free 4Mb RAM upgrade included in the price.

2Mb memory board (4Mb total) - **£85**
A compact board measuring just 104mm by 49mm, this design fits vertically in your machine. No soldering required. Unlike larger boards, there is no need to remove the disc drive. Four-layer design as specified by Acorn. A bare board (ie without the RAM chips fitted) is also available.

Hard disc upgrades

A range of fast (17mS) SCSI hard discs with a two year warranty, in sizes from 52Mb upwards. Supplied with all metalwork and cables. 400/1 machines merely require the drive and SCSI card. 300 series require a backplane.

52Mb - **£199** 105Mb - **£280**
120Mb - **£299** 210Mb - **£525**
Oak 16 bit SCSI card - **£100**

Various

Aleph One 386 1Mb PC Card - **£490**
386 4Mb PC Card - **£575**
Impression 2 - **£130**

Free price list available upon request. Prices exclude VAT.

A310 & A305 upgrade column Phone for special Acorn User show/october discount prices!

Memory expansion

Extra memory is without doubt the most worthwhile addition to any A300 series machine. Some programs won't even run with only 1Mb, and 2Mb is a bare minimum. Certain applications, desktop publishing for example, benefit from a 4Mb system.

Compatibility. The memory is detected and used by the machine automatically, so there are no special commands needed. Works with both RISC OS 2 and 3.10.

The use of only eight RAM chips ensures low power consumption. Compatible with ARM3 upgrades, backplanes, hard discs etc. This upgrade is supplied on just one, compact board measuring only 195mm by 40mm. Four-layer circuitry reduces electrical noise for trouble-free operation. The 2Mb upgrade may be upgraded to 4Mb later by the user, without any soldering. A copy of the fitting instructions is available free of charge.

A complete fitting service is available for our RAM boards covering courier collection, installation and testing, MEMC1a, return delivery and guarantee. This is normally a three-day service (eg, collected Monday, returned Wednesday). We have been upgrading 300 series computers for nearly three years, and during that time a reliability record second-to-none has been established.

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Still not sure? Compare it with the competition before making up your mind. Use our 14-day money-back guarantee to check it out for yourself.

RISC OS Carrier Board — £21
This is an easy to install adaptor board for the larger RISC OS 3 ROMs. A set of links on the board allows it to be used with RISC OS 2 and easily adapted for RISC OS 3 later. Suitable for use with the A305, A310 and A440. The adaptor has been fully tested with RISC OS version 2.00 and version 3.10. It is fully compatible with other hardware upgrades such as the RAM board described above, ARM3's, backplanes, VIDC enhancers and expansion cards.

4-slot backplane with fan — £57

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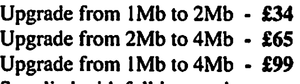
4Mb with MEMC1a, self-fit — **£199**
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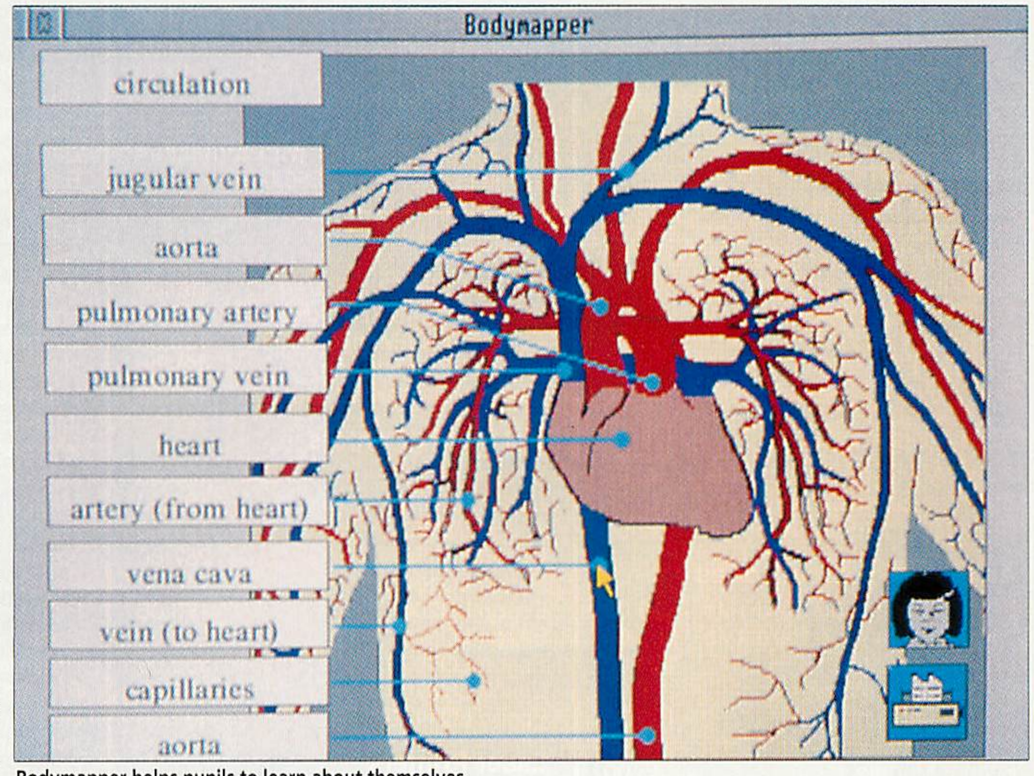
Not all multimedia relies on CD-Rom technology. Chris Drage takes a look at Genesis and Magpie

Multimedia is the buzzword in education this year, as competition hots up over the implementation of full-motion video in presentation software. Soon multimedia applications will handle text, still images, sound samples and short movies as common elements and begin to fulfill its promised potential.

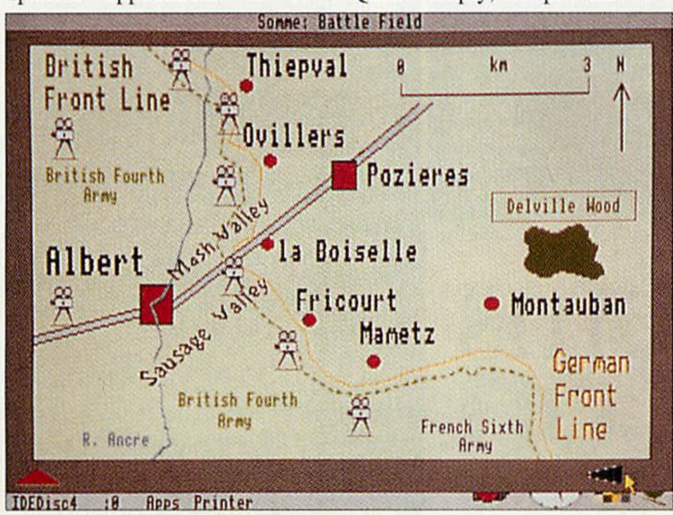
Multimedia applications can offer several advantages over more traditional methods of storing and presenting information by, for example, allowing speedy access to data without recourse to a succession of indexes and allowing the viewer/user access in the manner that she or he sees as important. This is especially true of large encyclopaedic applications.

In educational terms, multimedia has more to offer. It can be something children actively do rather than have done for them, and comes into its own when children can make videos, add sounds and put them into their own presentations and projects. This philosophy is in harmony with the National Curriculum, which sees computers not simply as passive, one-way providers of information but machines children do things with, offering them control over the media.

Genesis is an extremely versatile information management program from Oak Solutions. At its simplest level it will permit text, graphic images and sounds to be combined to produce a multimedia database while, at its highest level, its scripting language permits specific applications to be written without recourse to low-level languages like Basic. The possible range of applications is almost limitless. Quite simply, it provides a framework for creating pages of information which can be linked together to form an application.



Bodymapper helps pupils to learn about themselves



Battle of the Somme: most ambitious of the Genesis applications

Genesis can be an important element in both passive and active learning situations and is already spawning a wide range of very useful educational applications.

Magpie does not pretend to match the sophistication of *Genesis*. The latter program lends itself to providing target audiences with off-the-shelf presentations. *Magpie* is so simple to use that it puts the creative aspects of the technology firmly in the hands of teachers and pupils, offering a friendly, creative environment in which you can combine text, graphics and sounds to produce, what is in effect, a computerised 'ring binder'. Like a ring binder, new sections can be added or removed at any time or sections moved around as an improved order of presentation comes to light. Above all *Magpie* recognises that learning the vocabulary and grammar of the media is important: once children have directly experienced the process of creating their own presentation they will have a greater understanding of the nature of visual media.

GENESIS

Genesis applications are beginning to appear from a variety of sources although currently most are being published through Oak Solutions. Undoubtedly, the most ambitious of these is *The Battle of the Somme,* a presentation focusing on the events that

occurred around 1 July 1916, conceived and produced by Netherhall School in Cambridge with the help and support of NCET and the Imperial War Museum. In this application pupils can explore text, sounds, graphics, digitised photographs, databases, maps, Laservision stills and movie sequences through a wide variety of interlinked pathways.

The Battle of the Somme admirably illustrates the ability of multimedia to offer various ways into and through the subject. From the opening 'Library' the topic can be accessed via a calendar, popular songs of the time, maps, personal letters, the Roll of Honour, still photographs or condensed 'books' – hence providing wide cross-curricular links. This variety is likely to add to the subject's appeal regardless of children's gender and ability.

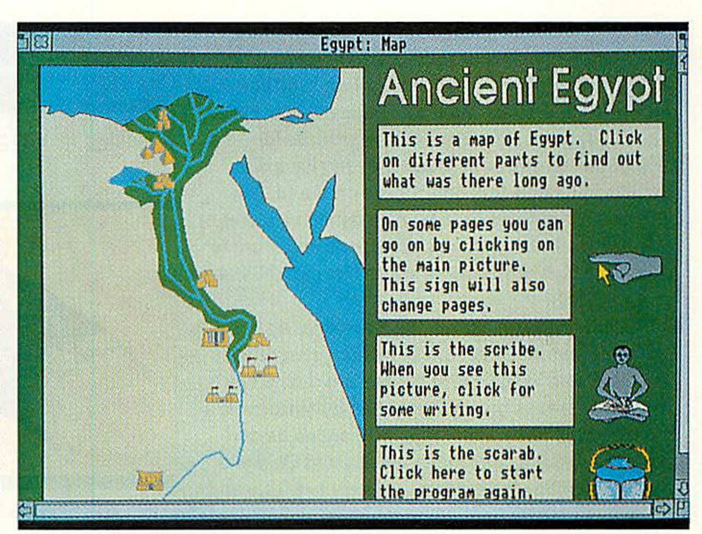
Although there is a significant amount of information available for floppy and hard disc users, it is the Laservision material which really brings the project alive, with movies, songs and so on, highlighting what is potentially a new beginning for that old Domesday system (or even using a new Laservision player and Genlock board).

EASTERN MYSTERIES

Using the *Ancient Egypt* application, one of the world's great civilisations can be explored via an on-screen map. Details like the delta, pyramids, temple and burial sites, and the river itself, are explored through information and copious illustrations. In so doing, children learn of the Egyptians' way of life and their beliefs.

The 'pages' are appealing and fun to explore but, sadly, any sound is absent. An 'easy reading' version of *Ancient Egypt* is available which contains less specialised vocabulary of value to younger pupils. This application is well suited to KS2 where it is admirably suited to National History Curriculum SSU7.

Castle Life is more complex, comprising over 100 colourful *Draw* files, animations and music in which children make their own on-screen exploration of medieval



Ancient Egypt reveals the secrets of the ages

Barnard Castle in county Durham.

In the process they discover how it has changed and find out about the people who lived and worked there. The level of language and concepts presented clearly place the content at KS3. The application encourages children to plan their 'visit' rather than following a preset route – an important point.

Ancient Egypt and *Castle Life* are among the most useful history-related applications to date. Either should serve to encourage group discussion at the computer, offer alternative routes to the information and to provide a different set of experiences for each learning group, stimulating much follow-up work away from the machine.

By another author, *Saxon Life* takes a similar approach to the above, fitting in neatly with NC History CSU 2. Through 150 screens of text and images, it attempts to bring the past to life in the manner of a colourful book but with one important difference: it too permits the subject to be investigated in a natural manner permitting tangents to the main line of investigation.

This strength is, unfortunately, also a weakness of this particular *Genesis* application, for should you deviate to another section of the database, there is no easy path back to the frame where the original deviation began, thus making it easy for children to get lost and encouraging random exploration. The only solution to this is to return to the menu and start again.

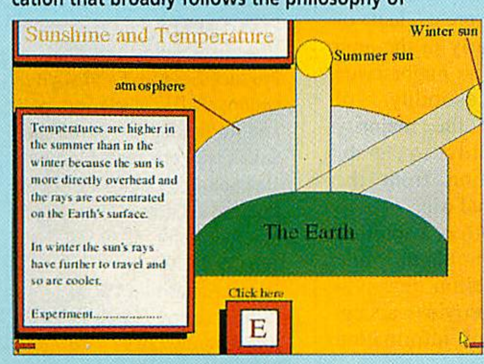
Another point that troubles me with *Saxon Life* is the level of the language. Typically younger KS2 pupils will be studying Saxons in school and, quite frankly, the vocabulary loading and the amount of text that appears on each screen requires a fluent and independent reader. A simple text version is required suitable for mainstream Year 3.

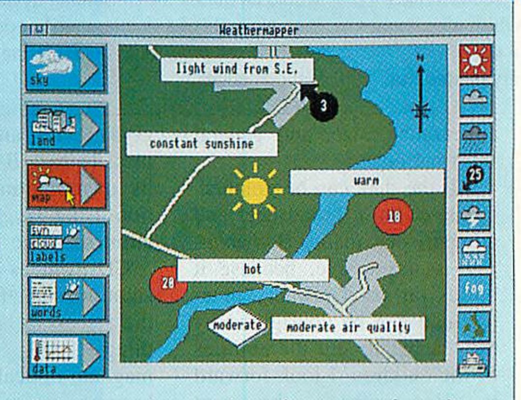
Another *Genesis* application, *Bodymapper*, is a very

AND NOW FOR THE WEATHER

It is inevitable that both *Genesis* and *Magpie* have spawned two applications based on a 'weather' theme; much emphasis is placed on weather studies in the various National Curricula. The *Magpie* application, *Weather* (below), is clearly a teacher-produced item which aspires to being an electronic textbook, and Longman Logotron hope to be able to distribute the application free to other *Magpie* users in the near future.In 30 or so screens, it broadly covers a range of related topics, for example, forecasting, weather lore, and the physical processes behind differing weather conditions. Although most pages of text and graphics are attractive, in the end it is non-interactive; a passive provider of information. Still, like other *Magpie* binders mentioned here, *Weather* begins to show what can be done with *Magpie*.

Weathermapper (above right) is a *Genesis* application that broadly follows the philosophy of





Bodymapper. It too explores the aspects of weather mentioned above, but is more related to how children grasp concepts. For example, each type of weather is illustrated in three 'layers': the land view, the sky view and a map. In each 'layer' information can be called up or, if preferred, pupils can input their own information and ideas. Sound and animated graphics certainly add to the appeal.

As in *Bodymapper*, collecting, collating and interpreting data is an all-important part of the application: there are data collection sheets, weather recording cards and comprehensive graphing and charting facilities to help children make comparisions and to discover patterns. Although *Weathermapper* is not the cheapest of resources, it nevertheless fulfills National Curriculum requirements well and provides opportunities for children to explore their own ideas.

MAGPIE BINDERS

Although there are no commercial *Magpie* binders, *Magpie* users are requested by Longman-Logotron to submit any interesting binders they produce for distribution to others. In return they receive a disc containing binders that others have produced. The intention is not so much to hold up definitive pieces of work, or work aimed at specific subjects, but more to amass and distribute binders created by real children in real schools.

The interest lies mainly in the techniques by highlighting a feature or method of working that other users may find useful. Some binders are class projects whilst others have been put together by teachers as a teaching tool. Not unnaturally, there are no binders yet that capitalise on *Magpie*'s Replay and CD-audio access. The following binders are freely available and are representative:

Vikings is an impressive little 10-screen binder created by children and using colourful graphics, children's own text and sampled voices. It covers all aspects of the topic the NC expects and would be a classic example to hold up to other children embarking on a similar project.

Covalent Bonding is a joint pupil/teacher binder which aims to teach and test concepts of atomic bonding in chemistry. The binder makes good use of colourful *Draw* files, and a smattering of voice samples adds interest although in some parts it becomes rather repetitive. This application amounts to a very useful revision exercise.

Whalefacts is one binder that effectively uses visual material in the form of digitised images and *Draw* files to illustrate the excellent points it makes. Anyone who has used Topologika's *Whale Facts* will recognise this multimedia version. In terms of content the binder is a useful source of information. However, as it stands it is simply another computerised reference book. Jupiter is a five-page binder which uses images from Spacetech's *Orrery* to illustrate the planet Jupiter. As it stands, the binder is very limited but invites pupils to add to it by providing similar pages about other planets in the solar system and this is where its value lies – as a stimulus for others to 'have a go'.

Perspective is another unfinished symphony (five screens) on the topic of perspective in drawing. Although brief, it makes good use of *Draw* files and digitised images and image overlays to reinforce the elements of perspective. Another good example of how to make good use of graphic images. *Mandelbrot* is a 29-screen binder which permits a Mandelbrot plot to be observed down to the fifth level – a task which would be quite time consuming by any other means. It is an example of a simple, specific application that teachers can produce as an aid to the illustration of difficult points.

useful resource to support a topic on 'Ourselves'. In terms of IT capability (TAT5) it also combines aspects of communication and data handling to very good effect. What impresses me with this particular application is the manner in which it presents information in both text and pictures irrespective of either race and gender.

The ability to zoom in and out of areas of the body and to reveal the external body shape, the organs and the skeleton in three 'layers' is a valuable asset in trying to get young children to visualise and understand the nature of their own bodies.

In addition, *Bodymapper* positively encourages children to express their own ideas, to collect, collate and compare data about themselves and their friends by offering data collecting sheets for physical appearance, size, and general information.

All the data can be graphed, tabulated on a broadsheet and comparisons made. *Bodymapper* is impressive, because it builds on good primary practice and can be configured by the teacher to suit the abilities of the children. I look forward to *Homemapper*, the next application to follow.

THE WAY FORWARD

Genesis is almost certain to become the Risc OS standard 'hypermedia' presentation tool and like Hypercard, its Apple equivalent, is already spawning a variety of useful applications.

Magpie, on the other hand, may teach us how to present information. Both are limited only by the availability of large, fast storage devices which are essential in order to make use of the memory-hungry movies and sound samples. In fact *BAU* has created its own multimedia presentation using *Magpie* and Replay clips (see page 111).

CD-Rom is not the ideal solution, since the devices lack the necessary speed. Perhaps things will change when magneto-optical drives become as commonplace as hard discs are today.

Multimedia using computers is still in its infancy and is surrounded by a great deal of 'hype', particularly in the area of CD-Roms. The major issue surrounds accessibility of information for the majority and the capability to 'grab' stored information from the Roms for personal use.

Networking offers a solution to the former problem, while suitable information management software provides access to the wealth of information stored on the disc.

The technology must always be subordinate to what teachers and pupils are able to do with it, and multimedia should enable children to use the data creatively rather than just absorb it passively. I see this last aspect as vitally important.

WANTED. . .

So what are teachers hoping for from multimedia? I can imagine in the future opening a magneto-optical disc on an imaginary application entitled *World Music* which will permit me to use a top-down approach to finding out information. It will ask 'What do you want to know about?' As this particular 'book' has to do with music I want to know about violins.

World Music will allow me to read about instruments, have text read to me, pronounced or explained as necessary, to listen to musical clips and to see moving digital images of, for instance, bowing techniques for violinists in good quality moving video.

I will be able to take 'snaps' from this and capture any of the other information for use in my own work – in short I can use a totally interactive learning resource. Using multimedia, we are now at the growing tip of what will become a very big iceberg indeed.

PRODUCT DETAILS

Product: Magpie
Supplier: Longman Logotron, Dales Brewery, Gwydir Street, Cambridge, CB1 2LJ
Tel: (0223) 323656
Price: £54.00

Product: Bodymapper and Weathermapper
Supplier: edIT Educational Software, 2 The Crest, London NW4
Tel: 081-202 0834
Price: £44.95

Product: Genesis 2 and applications (Battle of the Somme and Ancient Egypt, Castle Life, Saxon Life) are available from Oak Solutions, Suite 25, Robin Enterprise Centre, Leeds Road, Idle, Yorkshire, BD10 9TE
Tel: (0532) 502615
Prices: Genesis – £130.00 (Schools price: £99.00 ex VAT). Applications £29.95 each

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NewSchBook	Regular, *Italic*, **Bold** & ***Bold Italic***	(New Century Schoolbook™)
Book	Light, *Light Italic*, **DemiBold** & ***DemiBold Italic***	(Bookman™)
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Chance	*ABCDEFGHIJKLMNOPQabcdefghijklmnopq*	(Zapf Chancery™)
Math Greek	αβγδεφωϖ ⊂⊆∉∋∇∂∧∨äõ $\Sigma\Omega_{\alpha\gamma}$ ≠ℵ ↔ ⇒ ⇑	(Symbol™)

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Book	BookMan™	4	£35.00	£24.50
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NewCorn	ITC New Baskerville™	4	£35.00	£24.50
New London	ITC Garamond™	4	£35.00	£24.50
OldSchBook	Century Old Style™	4	£35.00	£24.50
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TOMORROW'S WORLD

The CD-Rom market is at a tentative state and many companies are on the verge of entering the fray. As usual in computing, the aim is more, faster and cheaper. Gordon Davis looks ahead

Every now and then microcomputing goes through a definite, and shockingly rapid, 'quantum leap'. The first wave of microcomputing saw the rise of the floppy disc, typically around 1Mb; the second saw the cheap hard disc, 20Mb to 100Mb; the third dawns with the CD-Rom, a jump to 640Mb for less than £50.

The third wave that is now breaking involves no huge upheavals in the basic design of micros. It is simply that a gradual increase in speed, combined with a drop in price, has led to a sharp increase in the mips and megabytes that a consumer can get for the pound. 'Multimedia' is just one term that reflects this change.

Multimedia reflects the fact that micro systems can now begin to absorb the more traditional forms of media, such as TV, video, and books, while adding their own peculiar flavour. The CD-Rom is central to this. Graphics and sampled sound demand huge slices of megabytes, and no other currently cheap technology is up to the demands.

THE PRICE FACTOR

So what does this mean to Acorn users, many of whom are in education? It must be said that at this stage that CD-Rom software is not a radical improvement over anything available in traditional formats, offering flashiness but little extra substance. Strapped for resources, many schools may be wondering what all the fuss is about.

However, 640Mb of instantly accessible data holds out the promise of valuable information resources at affordable prices. Under pressure from the consumer market, some CD-Rom prices have often already dropped from their previously unrealistic price levels to less than £50 per unit.

In addition the costs of pressing CD-Roms will decline and schools will increasingly produce their own. Uniqueway is one firm that is soon to announce an Acorn CD-Rom pressing service for the Acorn market.

One more factor is likely to affect pricing. CD-Roms can be made more difficult to pirate by the inclusion of huge amounts of irrelevant data, and it is possible that they may even become cheaper than floppy discs. Many observers predict that CD-Rom will become *the* format for home software, such as games, within three years.

CD drive prices are also an important factor in the popularity stakes. A few years back these were around £1000. Now they are roughly £300 and likely to drop to about £200 in the next year or two. As a result of price cuts, Cumana, one of the major suppliers in the Acorn world, estimates that there are 3000 drives in British schools. A recent government funding exercise (totalling £9.5 million to Spring 1994), aims to get yet more CD-Rom drives in schools and resources like this should make the CD-Rom drive a more familiar sight.

LONG-TERM PICTURE

The ultimate multimedia development is the provision of high-quality, full-screen graphics coupled with hi-fi stereo sound. The latter is easy; audio CDs already achieve it. However, considerable speed and storage improvements are needed to bring the former up to scratch.

The big problem is speed. A TV picture comes from the point of reception, the aerial, to the surface of the screen at barely under the speed of light. Not so a micro/CD-Rom combination; the 'picture' is digital and requires decoding, transmission over a parallel link, and subsequent recoding to produce a moving picture, which is slow. One way round this is to simply download the entire film into the micro's memory. It is faster, but when you are limited, typically, to 4Mb, only short clips can be shown.

To offer a whole film, it needs to be taken off the CD-Rom itself, frame-by-frame. By dropping the resolution, or offering only quarter-screen films, respectable speeds are now attainable. This limitation is not seen of lasting importance, however, and we should see really fast full-screen pictures relatively soon.

The second biggest problem



THE ACORN WORLD

Replay is Acorn's own contribution to the new age of computing and it is obviously hoping that it will win itself some new admirers. Among the items on the agenda for next year are two DIY Replay kits. The first is aimed at professional developers and will cost in the region of £1000. Allowing developers to incorporate Replay sequences into their own applications could give the multimedia market a significant boost.

The second DIY system is much cheaper, at £250, and will be aimed at schools and home users. The lower price will, of course, mean lower picture quality but Acorn are still optimistic about its potential 'to help users to create their own multimedia'.

But probably the most appealing development for the home user is the advent of Photo-CD, a sytem that allows you to keep all those family snapshots on a CD, and add new ones whenever you return from Bognor Regis. This process, we are told will merely involve a trip down to the local Boots with your standard 35mm film and Kodak, who came up with the plan, are currently talking to Acorn.

Finally those who have 16-bit graphics on their wish list will be pleased to hear that Acorn Replay clips already keep data in this form. In fact those with the appropriate graphics enhancer can already see the benefits of this within existing Replay clips.

is data storage. While 640Mb sounds a lot, at standard motion picture speeds, it can only hold a very few minutes of uncompressed video. One solution is to compress the data in some way, as Acorn's Replay system does, but this can lead to loss of picture quality and/or speed.

One solution to this is to put the decompression routines on-chip, in the drive; the problem here is that all CD-Rom manufacturers have to agree on a common compression standard, otherwise some format discs become unreadable, at least at speed, on drives of a different standard.

For this reason, CD-Rom has at least one promising rival, in the form of the hardware-dedicated Laserdisc system, which uses large format discs capable of holding an entire feature film plus its sound track. Laserdiscs have become successful in multimedia training and now are being aimed at well-heeled home video enthusiasts.

Apart form some video drawbacks, CD-Rom offers few disadvantages for other forms of storage. Text, for example, is right up its street, and still pictures are no problem. With educationalists, the *Sunday Times/Times* CD-Roms are great favourites. Perhaps this is because they fulfil one useful criterion; they can do something that would be extremely inconvenient without a computer.

Putting a simple encyclopaedia on CD-Rom can look fancy, but it's almost as easy to flick through an actual printed work to find what you want. On the other hand, I'd challenge anyone to rummage through last quarter's papers to find every reference to, say, the Maastricht treaty. You can do this in an instant with a CD-Rom.

CD-Rom could be said to be fantastic as interactive TV, but perhaps as an extension of the printed word it may even offer more; a supplement to, or even replacement for, normal printed matter it shows enormous potential. It's possible that with enough drives installed, some learned journals might even prefer to appear on CD-Rom only.

Proliferation of this kind of material will make possible an upsurge in hypertext systems, in which users can find their way around masses of data, following their own routes, filing the bits they want, pulling out pictures and so on. So far, Arc hypertext systems seem to be only imperfectly implemented.

The other big flaw is that, except for Photo CD, CD is read-only. This is ultimately a wounding limitation. The cheap, easily formatted floppy disc helped to promote the first and second waves of microcomputing. The third wave needs a convenient equivalent for bulk storage media. The up-and-coming contender in this area of technology is the magneto-optical drive.

One other advantage of CD-Rom drives is often overlooked: that of the dual-function drive. Most CD drives now coming out will also plug into the domestic hi-fi system and play audio CDs; two for the price of one.

However, it seems unlikely that CD-Rom will be overtaken as a cheap storage medium in the near future. There are too many incentives for the consumer involved. By the end of the current CD-Rom Pilot scheme, Cumana estimates that there will be 100 Risc format CD-Roms available, with another 100 MS-Dos titles. At this point CD-Rom begins to become a powerful data resource.

A number of formats are currently contending for the consumer market. A key aspect of CD-Rom is that the data (unlike that on floppies) is always readable, whatever the computer. We already have the Mac and PC CD-Roms, for which Acorn front-ends will undoubtedly be produced.

However, the really big home mass-market battle is looming between Philips CD-I and Commodore's CDTV standards. No-one is certain which will win. Both are heavily oriented towards home use and so may eventually fulfil the demanding criteria of multimedia critics.

But you can be sure that enterprising Acorn developers will find ways to emulate both of them, sooner or later. The developments established with Replay are just the start...

Text
SOURCE: The Times DATE: 21 February 1992 PAGE: 3
The search, the lost key and the stateroom;Death of Robert Maxwell
By Lin Jenkins

ROBERT Maxwell's behaviour in his last few days was out of character and strangely indecisive, according to investigators acting for his insur... unscheduled visit to his yacht, the Lady Ghislaine, days... waters off Tenerife.

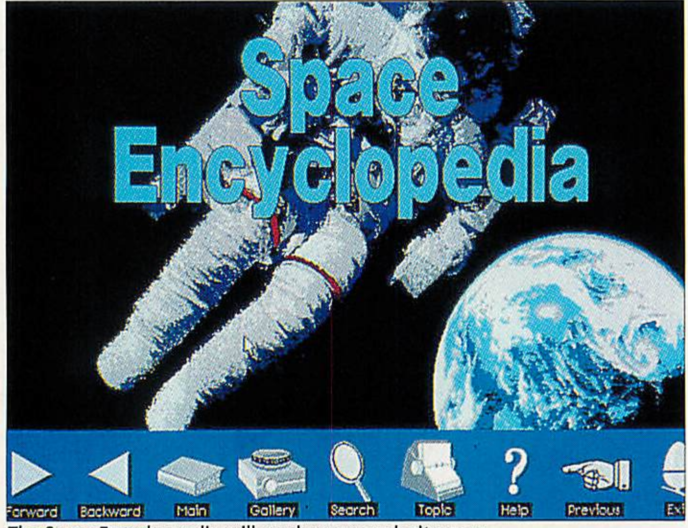
When an urgent telephone call came through to the brid... year from John Bender, vice-president of Maxwell Macm... could not be found. As Captain Gus Rankin led a search... that all doors to Maxwell's stateroom were locked. Lisa K... stewardesses, had locked the main stateroom door from... and left the key in it. Captain Rankin opened it with the... his employer had been wearing earlier abandoned on th... the assumption being that before going out on deck Ma... entrances to the stateroom.

Four further searches failed to find Maxwell and, after a...

Graphic
CANARY ISLANDS
Tenerife
3
17.50 Body found
Las Palm
Gando ai
Grand Canar

Paul :0 Apps Econet Times 5:49:44 pm. 23/9/92

Your daily newspaper will really come alive in CD-Rom format



The Space Encyclopaedia will reach escape velocity soon

WHAT DO SCHOOLS WANT?

As a result of government spending on CD-Rom equipment for educational use – £8 million over two years – few secondary schools will be without systems by the end of this academic year. Therefore, whatever the justification for this expenditure, it is vital that we look for good curricular uses for this equipment. This requires more Roms designed specifically for educational use than most presently available. Future discs should deal with subject matter that cannot be gained or searched through easily using other media.

This may include the variety of newspapers currently offered, but what about a collection of raw news data from Reuters or the Press Agency? Perhaps a series of television news broadcasts for use in media studies, citizenship and history lessons could be useful. Discs holding a variety of images for use in report writing and DTP documents would be of wide curricular use. Interactive experiments and simulations currently too expensive, dangerous or difficult to pursue in school laboratories are ideally suited to the medium. Moving images and statistics for use in geography, historical documents to be searched through for project evidence, both valuable especially when easily searchable according to categories in both National Curriculum documents.

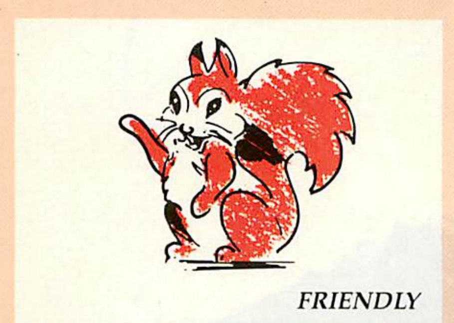
If we get all these and more, don't these systems belong in the school library or resources room, not as a piece of technology in the IT room? They shouldn't be there to put down as an experience, but as a real and useable resource. Oh, and perhaps teachers could have *The Times Educational Supplement* available, so we don't have to keep all last year's copies under the stairs.

Claire Johnson, Education Specialist

SQUIRREL



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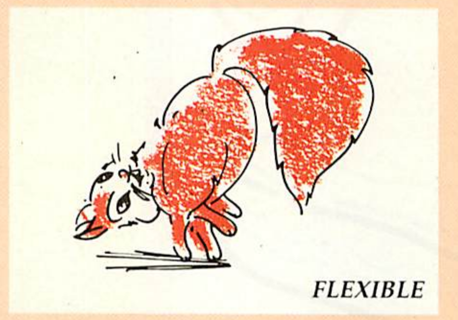
FRIENDLY

Squirrel is the easiest to use database yet, allowing simple point and click database creation and queries.



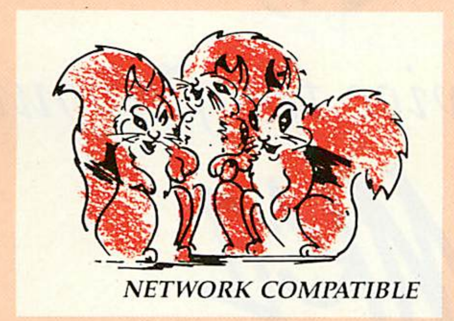
FAST

Modern indexing techniques mean superfast searches every time.



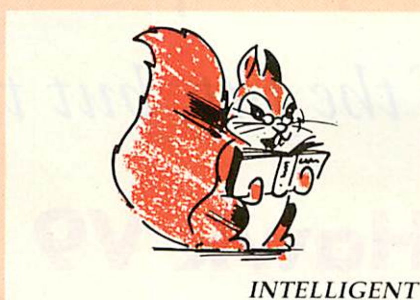
FLEXIBLE

Images, text and sound may be stored in the same database



NETWORK COMPATIBLE

Client/server design ensures that squirrel runs just as well on networks as standalone.



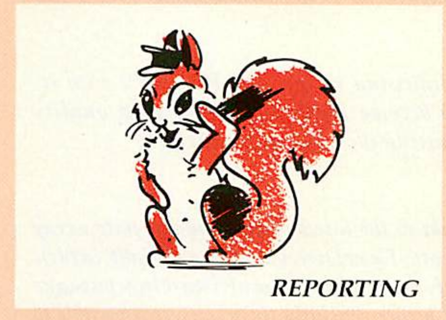
INTELLIGENT

Squirrel understands days of the week, months of the year and recognises files from other popular packages.



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Recipe and instructions

The live video display is dithered in hardware, thanks to the latest programmable gate array technology (such as you'd find in Computer Concepts' LaserDirect and Scan-Light cards). Grabbing a sprite, either to save or drag directly into another multi-tasking package couldn't be easier. Because the images are enhanced before reaching the screen, it is possible to simply point, click and save. Of course, the image manipulation routine ChangeFSI is still included if you wish to mould your image further. The whole process is fast, friendly and flexible.

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NET GAINS

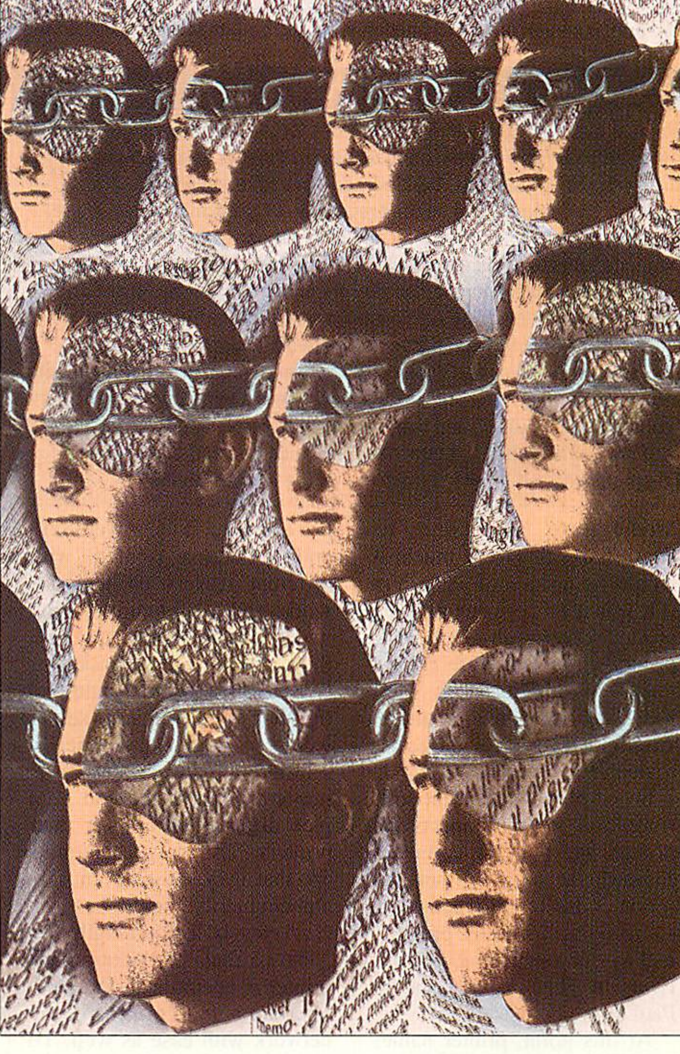
One of the great benefits of networking is that a number of people can share those expensive printer resources. Philip Blundell explains how

Laser printers may be indispensable in today's world of business computing, but at around £1000 they don't come cheap. As a result, if you have several computers it hardly makes sense to equip each of them with their own printer. So what happens if more than one user needs to do, for example, desktop publishing, and produce laser-quality output?

Those of you who read last month's article will remember Irene, Anna, Meg and Paul, the four-person DTP team. They would benefit from being able to share printers. For her DTP work, Irene has provided herself with a PostScript laser printer, which is attached to the serial port of her A5000. Paul also owns an Epson dot-matrix printer, which he uses with his BBC Model B. They can't afford any more printers, though both Anna and Meg need to print sometimes.

Before they had a network, they were doing this by saving their documents onto floppy disc, and printing them on Irene's A5000 or Paul's BBC. Although this was better than not printing at all, it wasn't a good solution – they were wasting a lot of time moving discs around, and Anna occasionally had problems when a *Draw* file with lots of sprites wouldn't fit on one floppy disc. It would be far better for all of them if the printing could be done easily and 'transparently', without any extra effort on their part.

Since their machines are connected by an Econet, this can be done quite simply. Irene's machine has the printer, so this will become the 'printer server' – it will run software to take print output from other computers, and send it to the printer. There are various software packages available to do this job; *Spooler* from Oak Solutions is one, priced at £79.95 (10 per-cent educational discount). Alternatively, there are several public domain applications to do the same job, although these are usually less versatile.



DARREL REES

There are two main sorts of printer server; spooling and non-spooling. Most Archimedes printer server software is of the spooling variety – this means that data from other computers is spooled to a temporary file on disc before being sent to the printer.

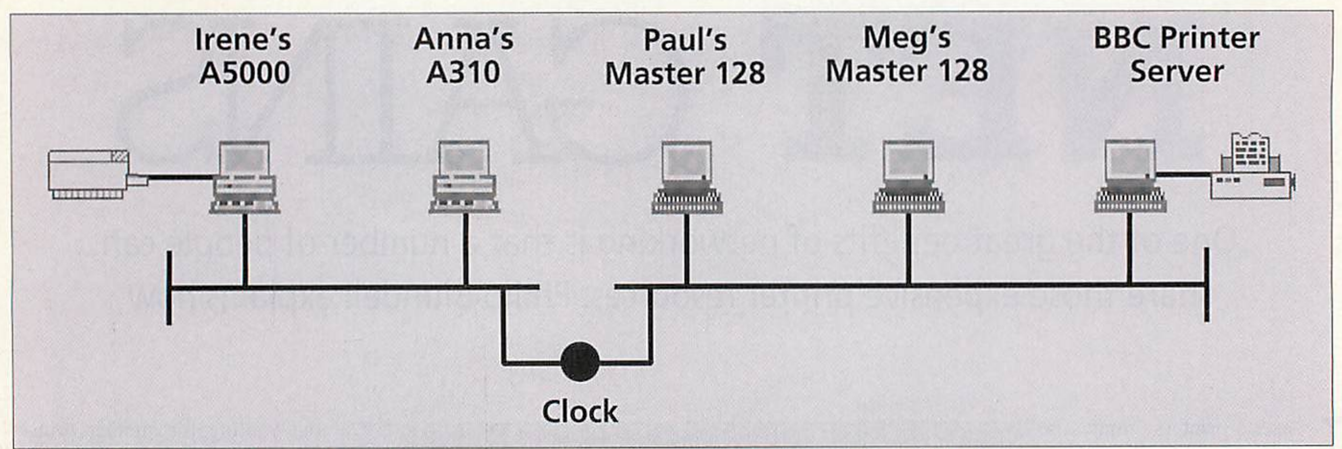
The advantage of this is that it allows several users to send print data simultaneously, and as soon as one print 'job' is finished its file will be sent to the printer. A non-spooling server sends received data straight to the printer, but this means it can only accept one 'client' user at once. BBC-based servers tend to be non-spooling.

The group want to be able to print whenever they like, without waiting for another print-out to finish. Irene therefore decides on a spooling printer server program. This is installed on her hard disc, and runs 'in the background'.

The setting-up required is fairly minimal; she needs to give the printer a name (which can be from one to six characters of text) and tell the server which port on her computer it connects to – in this case, the serial port. In addition, she can create 'banner' files that are sent to the printer before and after each user's job. Since these are not needed, and would be a nuisance, she leaves them blank.

The printer server is now ready to operate. Whenever Anna wants to print on Irene's printer, she needs to load *PrinterPS*, then move to the Econet option on the menu and type in the name of Irene's printer. Of course, she can use Save choices to set this as the default, so she doesn't have to type it every time. Once she has done this, she can just print as usual – by dragging files to the icon, or by selecting 'print' from the menu in *Draw*.

While her computer is printing, the hourglass will show and the 'LEDs' at the top and bottom will flash on and off. The file is now being sent over the network, and stored on disc on Irene's machine. A few seconds later, it will be sent to the printer. This means that Irene must have enough free disc space for the entire file; if it is a large one with several sprites, this may well be a megabyte or more. It is therefore important that the printer server has an adequately sized hard disc. If the disc is full, nothing catastrophic will happen, but the printer server obviously will not work.



A spare BBC micro can serve as a dedicated printer server, or an Archimedes, with appropriate software, will do the job part-time

Of course, Irene can still continue to use her computer and print normally, ignoring the printer server. While she is using the printer, nobody else will be able to print to it; conversely, if a printout from someone else's computer is being sent to the printer, Irene will be unable to print.

Irene does need to bear in mind that since the printer server runs as a Wimp task, if she leaves the desktop or starts some very time-consuming operation, anybody trying to print may well find themselves 'frozen out'.

Since Irene's machine is the printer server, she can perform various 'management' tasks on it as well. For example, she can examine the 'print queue' of jobs waiting to be printed, and then push an urgent job to the front of the queue, or delete one that should not be there. She can also disable the server temporarily if she doesn't want anyone else to use her printer, or if there is some problem with it; for example, if it has run out of paper. In this case, depending on the exact circumstances, printouts may be stored on her disc and just not printed, or the server may refuse to accept printouts from other machines at all.

Paul and Meg, though, are feeling a little left out of all this. Since they are Master 128 users, it's more difficult for them to create the PostScript output that is needed to drive Irene's printer. For rough drafts of documents, it would be easier and quicker if they could use Paul's dot-matrix printer. Even Irene and Anna may want to use the dot-matrix from time to time. Luckily, Paul happens to have his old Model B to hand. Since he doesn't use this very much, it would be no great loss to him if it was used permanently as a printer server – although BBC printer-server software can be made to multitask, it isn't nearly as convenient as on the Archimedes, so it is far easier to dedicate a machine to it.

So he obtains the right software, sets it up, connects the printer, and puts the computer somewhere safe so that the server isn't stopped by someone accidentally pressing a key or switching it off. Everyone can now print to Paul's printer as well.

At this point, printer names suddenly become more important. Both Irene and Paul have had to give their printers names; these might be PSCRPT for Irene's and EPSON for Paul's. The reason for this becomes apparent as soon as someone tries to use one of the printers. Without the facility for printer naming, it would be far more difficult to specify which printer they wanted to use. It would be possible to select a printer by station number, but the naming system is more flexible. For example, if there were several dot-matrix printers with different servers on the network, and a user didn't mind which one of them was used, they could simply ask for EPSON as a printer name and the first free dot-matrix server would be automatically selected. Obviously, then, it is important that Irene and Paul pick different names for their printers. The only constraints are that they must be entirely alphanumeric, and be six characters or less in length.

Now that the dot-matrix printer is operational, Paul and Meg are able to print over the network with ease as well. To do this they need to type *PS <name> to choose the right printer, where <name> is the name of the printer that they want, and then *FX5,4 to select the network printer. Then they can print as normal.

Assuming they don't have other printers attached to their machines, it would be sensible to put these two commands into a *!Boot* file for them, to save them typing them every time. A 'transient' machine code program called *PS* is supplied in the library if you have an SJ fileserver. This does basically the same job, though it also sets up the FX5,4 and FX6... settings for you. To use this rather than the built-in *PS, you should type */PS <name>. This is also the way to select a printer server on a BBC micro.

More or less the only disadvantage of network printing is that it is a little on the slow side. This is because the printing protocols were originally developed for BBC machines, and send the data for printing in 80-byte blocks. With big printouts, it can take some time for the data to be shunted across the network. To speed it up, you can always print to a file locally, then drop the file on the printer driver icon. It will then be sent 'in the background', so you can carry on using your computer.

However, there is another solution to the speed problem. Direct-drive lasers are definitely faster than Postscript printers, but they can't be connected to a printer server in the normal way. Also, of course, you would need the driver software at the other end. Luckily, both Computer Concepts' LaserDirect, and Calligraph's ArcLaser come with special software to allow them to be used as Econet printer servers.

This also has the advantage that the printed data is compressed and sent in larger chunks, which gives a large increase in speed.

This series of articles should have given you some insight into what a network can do for you. We hope in future to cover other topics related to networks, including every system manager's nightmare – how to make applications run.

AUN

The Acorn Universal Network, or AUN for short, is the new standard for Acorn networking. From the point of view of the user, it will remain fairly similar to existing systems; this, indeed, is one of its advantages. A standard environment can be used regardless of the actual system in use. The strategy is to interlink Econet and Ethernet networks to form one larger network. Any computer will be able to talk directly to any other computer, regardless of whether they are on the same network or not. The networks will be linked by Archimedes workstations acting as 'gateways' and transferring information from one network to another.

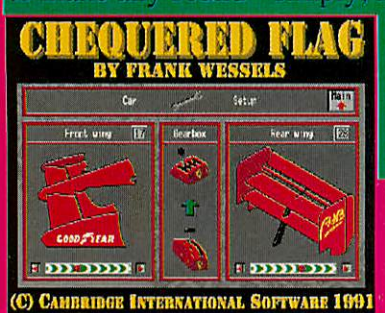
For example, on a large site you could equip each room or department with its own Econet network, and link them all together with Ethernet. The Econets would be small, and therefore fast – particularly if they are all-Archimedes networks. A central fileserver could be attached to the Ethernet, and used by all the machines on the whole system.

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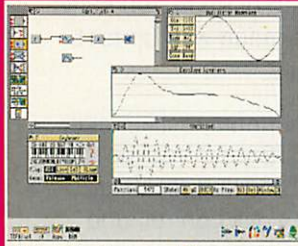
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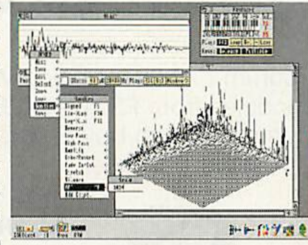
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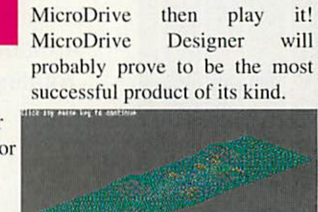
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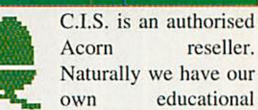
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GAME SHOW

With Christmas looming up fast and the new Acorn A3010 'games computer' in the shops, the games industry is gearing itself up for a busy ride. Next month, *BBC Acorn User* presents a mega-sized games issue that reveals all you need to know to buy games this winter, and much more besides. But first, this month's games news . . .

The Bitmap Brothers are a famous programming trio who made their name in the 16-bit world and who were responsible for the design of games such as *Gods*, recently converted to Acorn format by Krisalis Software. This has already been acclaimed as being the definitive Acorn platform game.

The Bitmaps have now turned their attention to what one PC magazine described as a 'rough-and-tumble' platform game called *Magic Pockets*. You play the Bitmap Kid with the bottomless pockets in a nasty world called Pocket-Land, where cruel and unusual monsters roam free.

The Kid is in search of his favourite toys, littered in a most untidy fashion around the rocky platform scenario, and he can use bicycles, boxing gloves and even diving helmets to thwart the nasties.

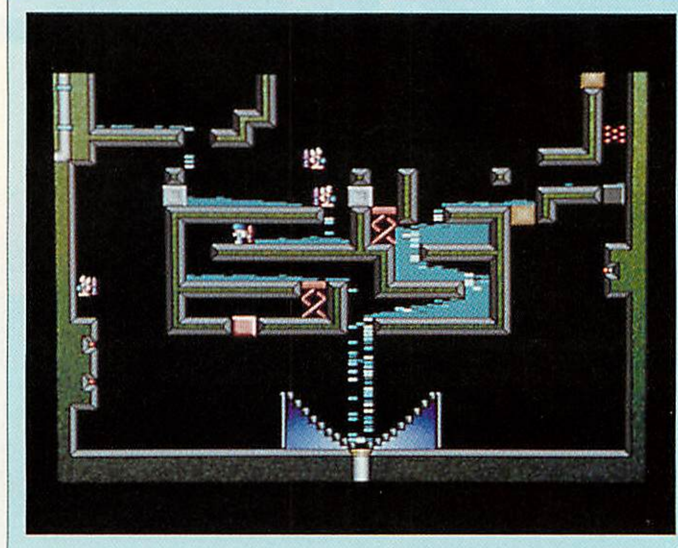
A complex system of 'power-ups' can give the Bitmap Kid up to 10 different gadgets to help him in his quest and extra bonuses are obtained by despatching a nasty into one of the special traps. *Magic Pockets* will be converted to the Acorn range by Christmas and another Bitmap game, called *Chaos Engine*, is also due to get the 32-bit treatment.

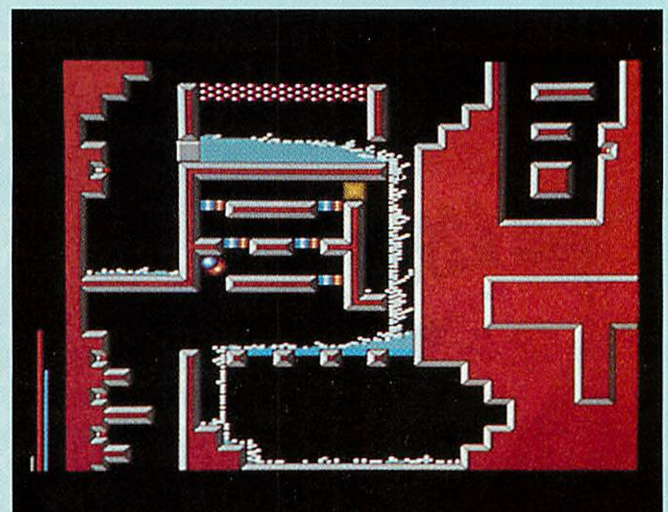
Yet another Bitmap game which has been widely acclaimed, *Xenon 2*, is also being converted, this time by a new games company, Software 42. *Xenon 2* was released three years ago on 16-bit machines and became something of a milestone due to its amazing graphics and fast 'n' furious gameplay.

Xenon 2 is basically a shoot-it-if-it-moves arcade space game, in which you fly your spaceship up and down a vertically scrolling landscape blasting the pants off anything and everything.

Software 42 is planning to release *Xenon 2* together with five other games, including two flight simulators created using the *Flight Simulator Toolkit* from Simis, at the *BBC Acorn User* show.

SPOT THE DIFFERENCE





Water, water everywhere . . . New game *Cascade* (bottom , we think . . .), written by two programmers in Cambridge, bears more than a striking resemblance to The Fourth Dimension's water game, *Cataclysm*, released last year (top, could be . . .). Litigation is thought to be in the air, and it now looks as though *Cascade* will be deprived of the light of day.

DAN GOES COSMIC

The Fourth Dimension will soon be releasing *Galactic Dan*, a strategy arcade adventure game that is set in outer space. Vorian robot warriors have invaded a sector in the Federation of Planets and captured the inhabitants of a small moon.

As combatant extraordinaire you battle against the robots through a labyrinth of brightly coloured corridors, picking up hostages that look suspiciously like those humpty-dumpty toys that rock backwards and forwards in all directions but never fall over. You then teleport them back to your planet, avoiding incredibly large, hairy spiders.

The early version of *Galactic Dan* we have seen is fast and smooth, and looks quite promising. Another one to look for at the show.

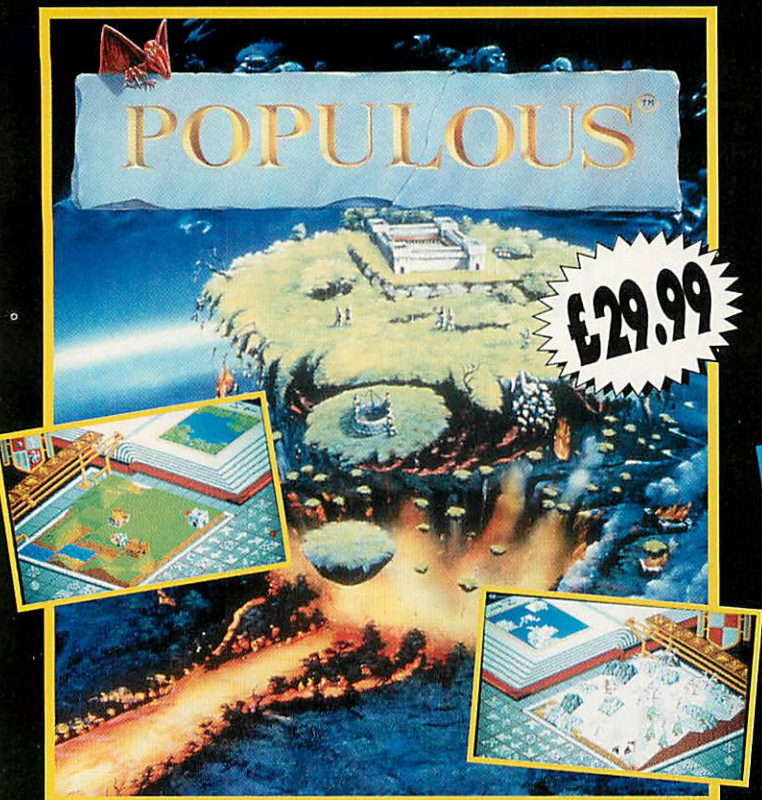
DOING THE DOO

The newly formed software house, Image Systems, whose first release was a reincarnation of the chip-shop arcade hit *Mr Doo* (see review), is busy preparing a game to follow *Mr Doo*'s lead.

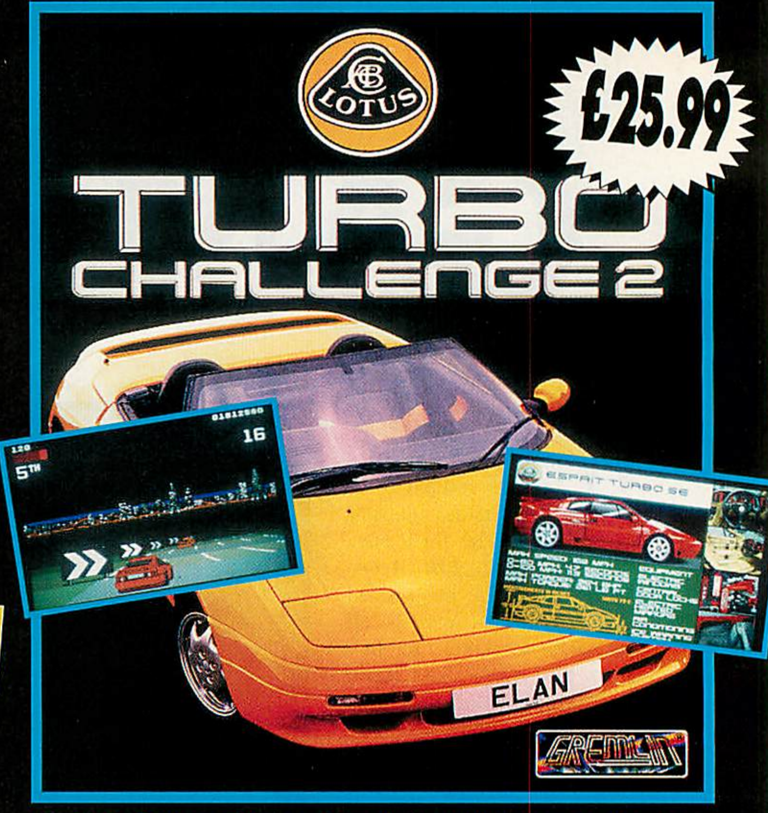
News of this game, called *Globdule*, arrived in a somewhat unusual way: I don't believe anyone has ever sent us an actual globdule before and I'm not so sure that isn't altogether a bad thing. A globdule could be adequately described as a pink lump of something that looks a lot like a horror movie *Blob*, and our instructions were to try throwing it at walls or windows and watch it slime down them. This, says Image Systems' Stephen Kett, 'should give you the idea of the game'.

In the game, you control a globdule (with a face) that does exactly that when not oozing round corners or squeezing through cracks. Catapult your male or female globdule at a wall in the game scenario and it will go splat.

However – *BAU* Health Warning – catapult your Image-supplied real-world globdule, regardless of gender, at anything whatsoever in your living room, and the only thing likely to go splat is your face when the person whose precious vase, clean window or

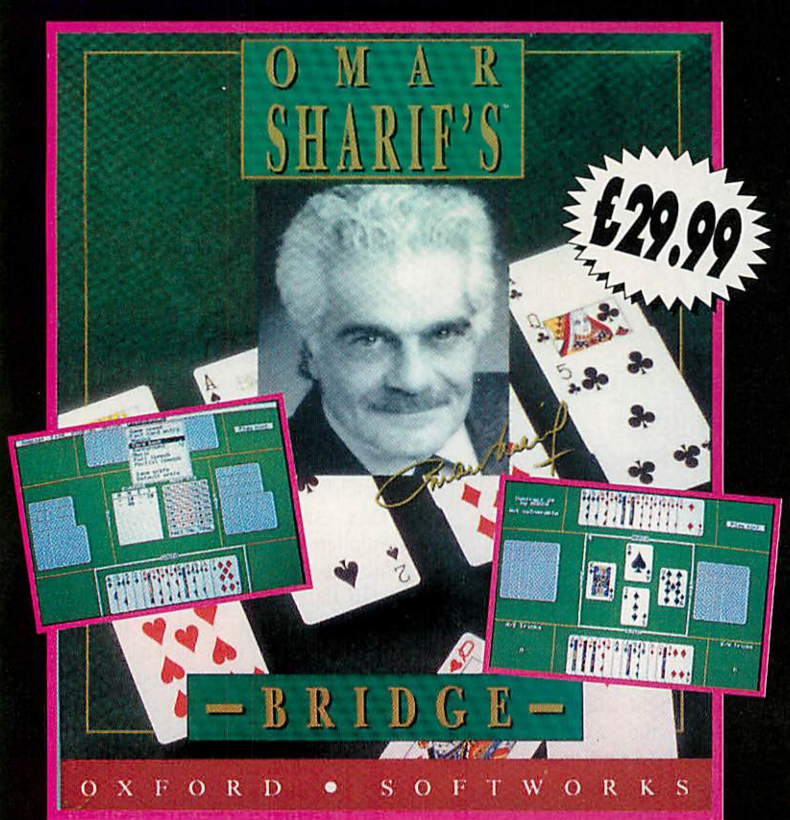


As a Divine Being you have a group of followers from whom you derive your power. The more followers you have and the greater their achievements, the more power you wield. Unfortunately, there is another group of people who follow a different deity. Since there's barely enough room in the world for your own magnificence, two won't do. You must rid the world of the opposition. To do this, you will use your great power to move the earth and your devout followers to crush the misguided.



Lotus Turbo Challenge II is regarded as the best driving game to date. In an amazing piece of programming Krisalis have converted this best seller for the Acorn Archimedes and compatible computers.

- One or two player options.
- Hair raising hazards, rain, fog, snow, commuter traffic, tunnels and bridges.
- The opportunity to race a sleek Turbo Esprit or the stylish Elan soft top.
- 8 death defying stages with over 60 checkpoints.



Imagine yourself at the tables of Monte Carlo, playing bridge with the masters of the game...with Omar Sharif,world famous bridge columnist and card player, as your partner and personal tutor!

The many features of Omar Sharif's Bridge give you complete control over the game. You can set up your own hands to practice slams, no trump hands defensive play, or work on specific weaknesses of your game. Explore alternative lines of play with 'Take Back' and 'Rebid' features. With the on-disc tutorial, Omar Sharif's Bridge is the perfect way to learn to play the world's greatest card game... with Omar Sharif as your own personal tutor.

All games compatible with Acorn Archimedes & compatible computers

3 great games making their debut appearance at the Acorn User Show '92

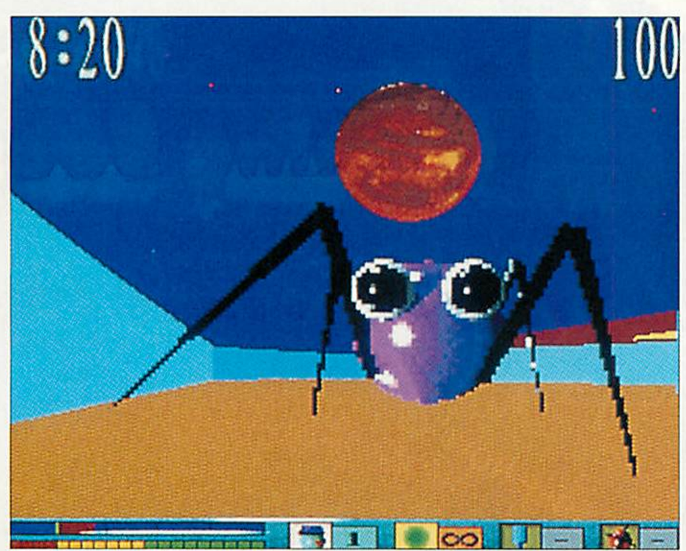
Anyone not attending the show can obtain copies direct by sending a cheque or postal order to Krisalis Software Ltd. or, telephone your order using your Access or Visa card. You can also fax your order giving your credit card details which must include expiry date.

All orders will be dispatched on October the 16th 1992 by first class post. Carriage is paid by us in the UK. (Overseas orders add £3.00)





Krisalis Software Ltd., Teque House, Masons Yard, Downs Row, Moorgate, Rotherham, S60 2HD.
Telephone 0709 372290. Fax 0709 368403



Galactic Dan: arachnophobia can be a cosmic experience

bowl of cornflakes has suffered a direct hit, finds out about it.

We have discovered on behalf of our readers that globdules are a bit too slimy to be recommended as household pets and Image Systems has since advised us not to try throwing them at plaster walls because: 'they take the plaster with them'.

Yes, thanks, we know. The game itself promises to be a tad more house-trained and should be available in a couple of weeks.

Soup Trek – The Search for Stock is the first game from yet another new software house called Elemental Software. The early version shown to us has a lot of appeal.

Small stupid droids that behave a bit like *Lemmings* wander around a space cavern searching for soil and by selecting one, and giving the little moron a bit of directional advice, it will happily start gardening away.

The overtones are sedate, not sadistic like *Lemmings*, and before you can scream 'onion soup!' the cavern is literally bouncing with jolly vegetables ready and willing to be shown the door to the 'crusher' and cooked into a nice steaming broth.

The droids all pop out of a mother ship that itself bounces around the play area – a disused garden theme park – under mouse control. The idea is to cook enough soup to feed the starving population of Planet X, a once prosperous world that has suffered an ecological disaster of epic proportions.

As a SoupFleet cadet your task is to return the little green-fingered droids to their formerly magnificent flower beds before it is too late. *Soup Trek* is still under development and, despite less than astounding graphics, it looks set to become a winner.

STOP PRESS . . .

There is a bit of an problem with The Fourth Dimension's long-advertised *Nevryon 2 – Technodream*, the sequel to the popular horizontal shoot-em-up *Nevryon*.

In *Technodream*, two players were assured of the chance to fly together, zap together and probably die together, in what promised to be an exciting improvement on the original game. But, unfortunately, the project has been abandoned only weeks before it was due to be released, because of what The Fourth Dimension is calling 'technical difficulties'.

However, like all 'technical difficulties' it is altogether possible that these may soon be overcome, once the author's search for an alternative publisher comes to a conclusion; rumour has it that Superior Software is the odds-on favourite. We may soon be seeing the game after all, probably with a different name, and in time for Christmas too.

Sam Greenhill

CHEAT BOX

Top Banana fans take note . . . To get infinite lives, open the *Banana* application of a backup copy of your game and drag the *!Run* file into *Edit*. Replace the line 'banana' with three lines: 'Load banana 8000', 'MemoryA A3CC 0' and 'Go 8000', then save the *!Run* file and play.

Thanks to Liam Corner of Peterchurch in Hereford for this. If you know of any cheats, send them to: Game Show, BBC Acorn User, 101 Bayham Street, London NW1 0AG.

MR DOO

Image Systems
Tel: (0229) 430200
£23
Risc OS machines

It's always nice to come across an up-to-date version of a fondly remembered BBC game, and so I was delighted to discover that newly founded Image Systems was doing a 32-bit revamp of the old *Mr EE/Mr Wiz* game. My mind went back to happy days dropping enormous apples onto rampaging monsters and now, after an absence of several years, those monsters are back, but hardly rampaging.

You play a wizard who makes his way around a disused mine that is full of huge misshapen fruit and a pack of deadly monsters. Your task is to collect all the cherries and defend yourself from the monsters by dropping apples on them or unleashing a bouncy 'magic ball'. You have five of these, unlike older versions where you had one rechargable ball, so they must be used sparingly.

All this takes place over some 60 levels and more objects come into play as you progress, including lethal electric cables, explosives which have to be detonated to allow you to pass, and sliders which push you across the screen.

All the objects combine to make many of the screens a challenge to the most hard-nosed wizard and, if you get tired of the screens provided, you may design your own with the built-in editor.

The game can also be customised to suit you – the monsters or other obstacles can be turned off or on, allowing you to set the difficulty level to suit your reflexes.

On the down side, I would have preferred a little more hassle from the monsters who don't really pursue you so much as lollop about, only changing direction when they reach a corner. Also, you don't seem to able to push apples over ledges onto unsuspecting monsters, which was one of the best bits about the older games.



Cor crikey, you can't beat them doos like what we had in the old days

All in all though, *Mr Doo* has aged surprisingly well, and there's certainly nothing wrong with a healthy dose of nostalgia, as long as you keep it under control. If you liked the original, this updated version will keep you entertained for a good while.

Mathew Tizard



PARADROID 2000
Coming Soon
GRAFTGOLD Creative Software
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AVAILABLE NOW
POWER
Each edition is an interactive custom written application that runs from desktop on any Archimedes computer
POWER is:
Written by top games programmers
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WHAT ELSE CAN YOU BUY THIS CHRISTMAS THAT YOU'LL STILL BE ENJOYING NEXT CHRISTMAS
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Gribblys Day Out & Pesky Muskrats Bundle £39.99
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1st Floor, 23 Cooper Street, NELSON, Lancs. BB9 7XW

PLAY IT AGAIN SAM

Superior Software
Tel: (0652) 658585
£24.95
Risc OS machines

This is the first Superior Software compilation for Acorn 32-bit machines. *Conqueror* was, in my humble opinion, under-rated rather drastically when it popped up nearly five years ago as the second Arc game to appear. This doesn't mean it is old hat; it is still just as much fun to play now.

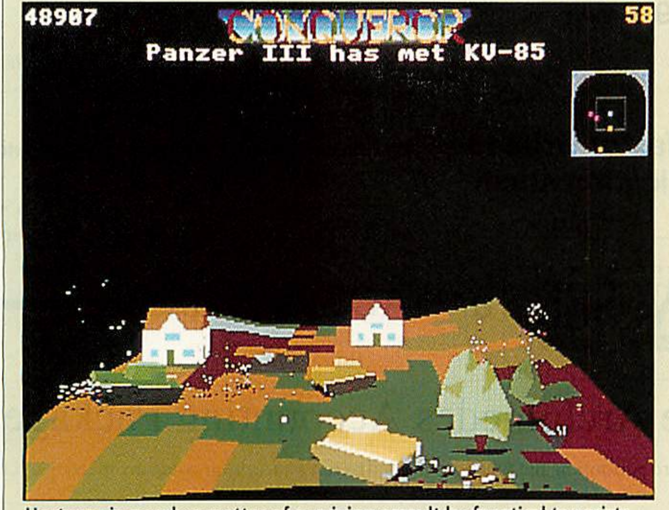
Set during the second world war, you drive a tank around a three-dimensional patchwork landscape blasting the pants off the opposition. You can choose to be American, German or Russian – my choice is a 68-tonne King Tiger with 200mm frontal armour and 185mm main armament.

There are three parts to the game but *Strategy* is the best, where you and your battalion of computer controlled tanks must hold a village or hill-top. You can jump to the map and control any tank in your battalion, call up artillery fire and use spotter planes to outwit the enemy. *Conqueror* is great but shame on you, Superior, for not updating the game to work properly with Risc OS. Once it's running there's no way back to your work in desktop.

Hostages is the next game in the compilation. As a representative of the Special Air Services your task is to rescue a bunch of dumb hostages from an embassy somewhere in Paris, by ducking and diving; abseiling down the embassy walls and swinging through windows already blown out by snipers; locating the hostages, popping a few terrorists and leading the sorry sufferers to safety. *Hostages* resembles a good action movie but lets itself down by being a bit slow in places. Pretty good for a while, though.



Conqueror is for those with a commitment to serious levels of firepower



Hostages is merely a matter of surviving assault by fanatical terrorists

In *No Excuses*, action is based on 'the grid', a sort of 3D chess board which has been overrun by aliens. By controlling the Strider, you must hop about, avoid holes, avoid aliens and shoot everything that moves, while negotiating a variety of different blocks, including jelly, glue, ice, radioactive and electric. Cute, but weak by today's standards.

Last but certainly not least is *Rotor*, a space game in which you fly a circular craft around an underground maze shooting wall-mounted guns, collecting mines and upgrading your ship.

This is a strong compilation, aimed at the shoot-em-up gamester. It is disappointing that no effort has been made to make the games compatible with Risc OS but, having said that, you can't really go wrong at only £25 for four games. Recommended.

Sam Greenhill

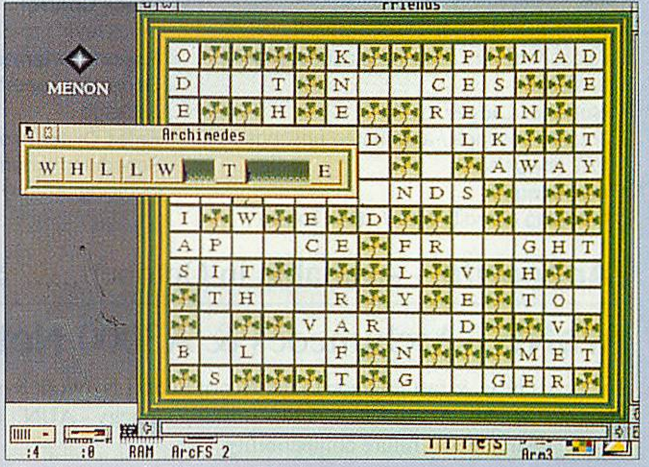
TILES

'A Crossword Game for Europe'
Brain Games
Tel: (0482) 643288
£19.75
Risc OS machines

The notion of a multi-lingual word game is good, it being 1992 and all that, and the idea of *Tiles* is simple – you are presented with a completed grid containing words – of whichever language you choose – and players take it in turn to match letters from their racks with those on the board, then each completed word scores points.

The fundamental problem with *Tiles*, though, is that the grids are already complete. You don't have to make up words from your set of letters – you simply have to put them on the board, just like a jigsaw. There doesn't seem to be much skill required and the game is, I have to admit, rather boring. The grids supplied are apparently aimed at nine-12 year olds but I can't see the game maintaining their attention. *Tiles* is not particularly intuitive to use. To load a new grid, you must choose 'small board' from the menu and only then does a load option become available.

During play, no link is made at all between a word and its meaning or any graphic representation of that word. I therefore can't imagine it being helpful in learning vocabulary.



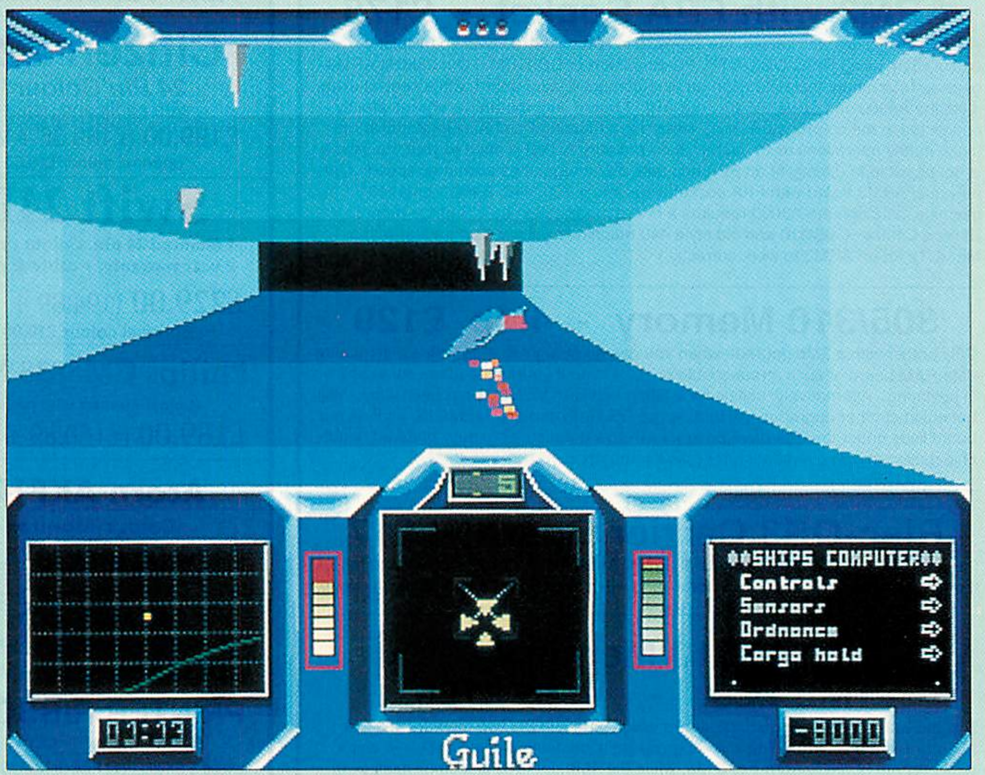
Tiles: *jeux sans frontieres* revisited

The grid files are in an odd format and since no editor is supplied, you're stuck with the limited set of ready-made grids. Although visually quite pretty, the basic idea behind this game isn't strong enough to make it work, either as an educational or 'fun' program.

Dave Acton

GUILE

Dream Limited
Tel: (0789) 450703
£29.95
Risc OS machines



Guile is not a game for claustrophobes

Tunnels, unsavoury characters and extortionate ticket prices? No, not the London Underground – it's *Guile*, the first offering from Dream Ltd. Take a large helping of *Zarch*, add a dash or two of *Elite* and, *voilà*, you have *Guile*. *Guile* is a 3D-vector graphics game involving skilled piloting, sharp combat skills and an astute trading aptitude.

You are the proud owner of the CV2000 tunnel craft, a fine vessel of many virtues, more of which later. You are also stuck in the most tedious solar system in the Galaxy, where everyone lives underground in big boring tunnels.

Your job is to gain fame and fortune by navigating the tunnels looking out for gold or gems, then landing on the nearest teleport platform, beaming to a trade port and flogging your booty.

Once you've peddled enough gear you may have enough money to buy a ticket on the interplanetary bus. Excess dosh accrued can be used to upgrade your spacecraft.

Piloting *Guile* is a bit like flying a helicopter, though rotating blades are replaced by one big central thruster, so to move backwards or forwards you simply raise or dip the nose of the craft.

This game is no tea party. The tunnels get more complex with the addition of of stalagtites and narrow passages, not to mention unfriendly ships.

Guile is not really very original but that doesn't mean it isn't any good. I found it challenging and great fun.

Andreas Englezou

2067BC

Oregan Developments
36 Grosvenor Avenue,
Streetly, Sutton Coldfield
B74 3PE
£16.95
Risc OS machines

In *2067BC* you play the part of a brave and fearless pterodactyl who must flap about, killing bees and dragonflies, and rescuing damsels.

You have control over three directions: left, right and up. The rate you flap your wings at determines the speed at which you can ascend, and the only way of coming back down is to let gravity take over.

The game is divided into 14 levels, each of which is spread out over a large playing area that scrolls to accommodate new scenery. Parallax scrolling is used to good effect to give a real sense of physical depth.



2067BC: a real cute game unless you're a dragonfly

Starting off in *2067BC* is rather like trying to fly a radio-controlled plane; you know roughly what should happen when you operate a particular control but it never quite does what's expected. After a few trys at hopping around and flapping though, you soon get used to the intricacies of prehistoric flight.

The next skill to master is killing bees and dragonflies, which involves picking up rocks and dropping them from above on the unsuspecting insects. Like flying, this takes some time to master, and a lot of practice is required before you can pick off your enemies at will. Progress through the game is made by completing different tasks and puzzles, giving the game a slightly arcade adventure feel.

2067BC uses brightly coloured graphics to give a cartoon-like feel, and a number of things, such as tiny mice running along the ground, help add to the overall cuteness.

Sound is similarly 'comic' and includes some rather amusing squawk and 'aarrgghhh!!' samples. There is also a tune that sounds like someone playing records on a turntable with a slipping belt. Not exactly the type of music you would associate with a prehistoric theme.

2067BC is cute – it doesn't rely on mass carnage (except for the dragonflies) to provide its appeal, so it could well be one for the younger kids.

Rob Miller

ON A PAR

Design three golf holes using CIS' Microdrive Designer and win a two-night stay at Scotland's luxurious Gleneagles Hotel

Would you like to spend a weekend at the five-star Gleneagles Hotel in Scotland? Well, now is your chance – by winning our special golf hole design competition, organised in conjunction with Cambridge International Software, distributors of the 32-bit golf simulation, *Microdrive*.

All you have to do is use *Microdrive Course Designer* from CIS to design three golf course holes (pars three, four and five) on your Acorn 32-bit machine and send the designs to us on a 3.5in disc, accompanied by the official entry form below. The winner will be decided by a panel of judges, including a golfing celebrity. The winning entry may also be featured on future Extra Courses disc for *Microdrive*.

The Course Designer is available from CIS by mail-order for £39.95, but *BBC Acorn User* is selling copies at the *BBC Acorn User* Show (October 16-18) and through our pages until the end of January at the special discount price of only £24.95. So be sure to pick up your discounted package and complete the entry form below.



The winner will enjoy the five-star luxury of the Gleneagles Hotel in Scotland

THE GAME

With *Microdrive World Edition*, the full version of this exciting golf simulation from CIS, you can play with up to three other players at seven 18-hole fictional courses around the world, from the English parkland of Lauren Hills to the tropical Palm Sands in the Carribean. All the fairway and rough dimensions of the real courses are recreated, as are bunkers, hills and trees. In fact, the only thing you need to provide yourself is the 19th hole!

The *Microdrive Course Designer*, which you will need to enter this competition, makes the game even more fun. Holes can be planned and viewed from any angle and you can create a variety of obstacles. While you can design courses using the *Course Designer*, to actually *play* them you will need a copy of *Microdrive World Edition*, which has just been updated and is due for launch at the *BBC Acorn User* Show.

For details contact CIS, Suite 2A, Leroy Business Centre, 436 Essex Road, London N1 3QP. Tel: 071-226 3340.

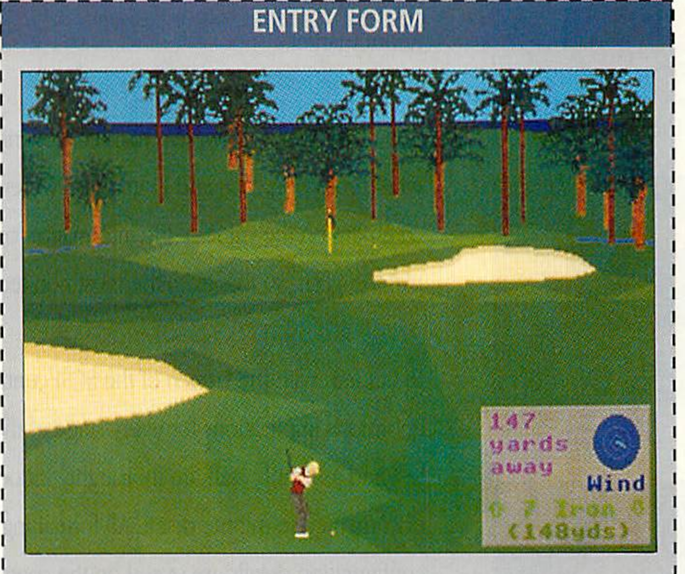
THE PRIZE

The winner of our competition will spend two nights at the five-star Gleneagles Hotel in Scotland, including breakfast and evening meals, and access to the hotel's outdoor sporting activities. Gleneagles is the home of the Scottish Open golf championship, and offers a world-class course. Other sporting activities range from horse-riding to clay-pigeon shooting, and tennis to fishing.

To enter just design three courses (pars three, four and five) using *Microdrive Course Designer* and send them on a 3.5in disc with the completed entry form opposite to: Microdrive competition, *BBC Acorn User*, 101 Bayham Street, London NW1 0AG. The closing date for entries is February 1 1993. Only one entry per form please.

Employees of Redwood Publishing and CIS and their associates may not enter. Travel to and from the hotel is not included. The judges' decision will be final and no correspondence will be entered into.

ENTRY FORM



BBC ACORN USER
MICRODRIVE COURSE DESIGNER COMPETITION

Name ....

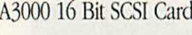
Address ....

.... Post Code ....

Please find enclosed a 3.5in disc with three course designs which I have created on a 32-bit Acorn machine using Microdrive Course Designer.

Signed .... Date ....

Oak Solutions SCSI Systems


A3000 16 Bit SCSI Card



Worra Winnie


High Speed Drive


Elite Drive


Worra Tape Streamer

1988

Back in pre-RISC OS days, it quickly became obvious that the limitations on capacity, performance and versatility imposed by the ST506 hard disc controller were an unnecessary hindrance to an otherwise excellent machine.

We set our design engineers the task of developing a design strategy, which removed the existing limitations of size and speed of hard drives and one which would give the users a versatile and reliable industry standard expansion bus that must have a future. They came up with the American National Standards Institute, Small Computer Systems Interface or SCSI as it is more commonly known.

1989

We asked our engineers to build a number of prototype controller boards with the chief aim of allowing maximuum data throughput - i.e. ensuring that the podule bus of the Archimedes rather than the speed of the controller card was responsible for the upper limit to performance - by definition it had to go as fast as you could run a SCSI podule on the Archimedes. The prototype designs were tested with as wide a variety of SCSI devices as were available and a decision was made to go straight to a 16 bit hardware design - the first SCSI controller for RISC OS and a design that has remained unchanged to this day. The Oak 16 bit SCSI card has gone on to become the best selling SCSI controller card in the Acorn market.

The next job was to write a manual, covering topics such as installation, initial testing, using the device, trouble shooting, write protection, Dos and Don'ts etc. We even tested the manual by asking ordinary users to install hard discs and comment on the value of the information contained in the manual. And then we re-wrote the forty six page manual in plain English, so that even the most non-technical person could understand!

In tandem with the launch of the SCSI controller card, we introduced a Zero Defect manufacturing philosophy. This had enormous implications for every stage of the manufacturing process. Every component and sub assembly is tested, all test and assembly staff are thoroughly indoctrinated with the quality message, every stage of manufacture and test is documented in minute detail. All formatting and software installation is performed prior to a final test, and important configuration details are stored on the controller card itself so that the user can simply plug it in and go. Finally, each completed product undergoes an exhaustive soak test, monitored by a computer which logs results and rejects anything less than perfect. In short, we ensure that everything within our power is done to guarantee that the products leave the factory in perfect condition, full working order and complete with all accessories.

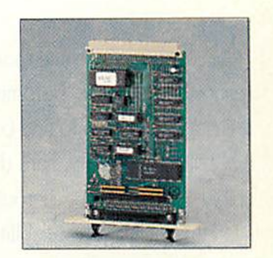


We Lead - Others Follow

Oak Solutions Ltd. Suite 25 Robin Enterprise Centre Leeds Road Idle West Riding of Yorkshire

QUALITY RELIABILITY

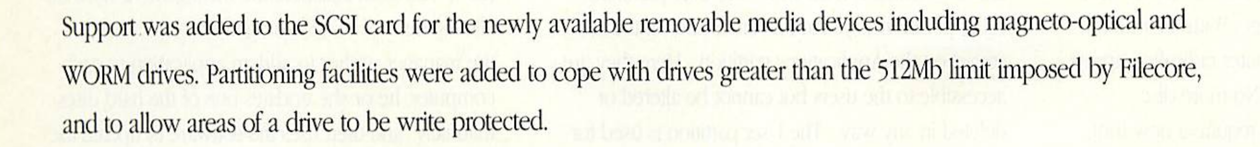
Zero defect doesn't end at the factory gate however. We have to ensure that delicate devices safely reach our clients anywhere in the world. Careful choice of carriers, and packaging designed to cope with situations far in excess of the worst likely scenario (existing Oak customers will know exactly what we are talking about) ensure that products reach the customer in the same condition they left the factory. Our technical support also had to be first rate, and so users were given direct access to the engineers directly responsible for the SCSI products.


16 bit SCSI Card

1990

We launched a range of tape streamers. Controlling tape streamers via the SCSI card was straightforward, however developing comprehensive backup software was a major task! Most tape backup systems allow only a simple bit-map copy of the source device to be made, but this technique does not allow you to restore just a single file or directory and carries with it a host of other important restrictions. After discussions with a range of typical end users, we derived a specification for the tape software. The software allows for manual and automatic timed backups of all or selected files from any filing system (including networks), and restoration of anything from single files to the complete backup structure.


High Speed Tape



Support was added to the SCSI card for the newly available removable media devices including magneto-optical and WORM drives. Partitioning facilities were added to cope with drives greater than the 512Mb limit imposed by Filecore, and to allow areas of a drive to be write protected.


DAT Tape Streamer

1991

With every hard disc system we supply a FREE bundle of software worth over £200.00 which includes Disc Tree hard disc backup and search utility, Euclid 3D graphics package, Genesis 1 multimedia package, RISC OS Companion 1, Worra Battle - a 3D tank battle game, and Remote Logon to allow you to access your hard disc remotely over Econet.

Launch of ClassRom, a new concept in the management of stand alone hard discs or numerous hard discs over Econet.


CDROM Drives

1992

Acorn launch CDFS 2.10, and we make CDFS an option on the SCSI Controller. ClassRom 5000 launched to allow the hard disc of the A5000 to be protected and managed alongside other ClassRom drives. Because of large volume production, we are able to reduce the cost of the SCSI controller card to only £98.00.


ClassRom

The Future

Because SCSI has emerged as the choice of the World's high speed workstation manufacturers, development of new SCSI peripherals will continue for a long time to come. We at Oak Solutions have the resources, expertise and commitment to continue to make these developments available in the Archimedes world.

Tel: 0274 620423 Fax: 0274 620419

COMPATIBILITY PERFORMANCE

Share Today.....

As computers become more widely available in schools they are also becoming more sophisticated. It is not uncommon to find computers with 4 M bytes of memory, hard discs, laser printers and colour scanners filling IT rooms across the country. With this increased availability and sophistication comes an increased management problem for those people responsible for looking after the school's IT resources.

Oak Solutions has developed a management philosophy which caters for single stand alone computers through to a large school-wide network. The Class Management philosophy breaks down into three major products ClassRom, ClassShare and ClassNet; each using industry standard hardware supported by state-of-the-art software to address a different but related set of problems.

Class *Rom*

ClassRom deals with problems associated with using hard discs on computers. Without a doubt, adding a hard disc to a computer radically improves the useability of the system. No more disc swapping when applications require a new font, almost instantaneous loading of applications and what seems like unlimited storage.

However, in a school environment there are drawbacks. The structure of applications and system resources stored on the hard disc is important and if any important files are overwritten or deleted, this could stop the system working. As hard discs are read/write devices this means that there is no protection of the applications from the user. This is where ClassRom comes in.

ClassRom is a system of protecting hard discs. It 'partitions' the hard disc into two separate areas; one which is protected (the Applications partition) and one which is read/write (the User partition). All applications, system resources and fonts are stored on the Applications partition. Here they are accessible to the users but cannot be altered or deleted in any way. The User partition is used for temporary storage of data either by the system or by the user.

The IT Coordinator has a management disc which allows the Applications partition to be unlocked in order for new applications to be added or old ones deleted. This software is password protected for maximum security.

ClassRom is available as a ROM upgrade for Oak Solutions SCSI cards, complete systems including hard disc and SCSI controller card or as a small plug-in board for A5000 IDE drives or A300/400 series ADFS drives.

In a network environment, where each computer has a ClassRom attached, the management software allows them all to be managed simultaneously. If the manager wishes to add an application to each computer, he or she updates one of the hard discs manually and then uses the software to update the rest over the network. If several changes have been made, this process can be set up to take place overnight.

So, ClassRom solves the two main problems with using hard discs on computers within an educational environment, stopping the students deleting the software and managing twenty or so individual hard discs.

Class *Share*

If you currently have floppy disc based computers and would like to add hard discs to each but don't have the money, the ClassShare system may solve your problem. Based on the principles of ClassRom, ClassShare allows a number of computers to share the ClassRom hard disc of another computer. A ratio of 4 computers to each hard disc is recommended, however, more computers can be connected if required.

The way it works is very simple. Take a scenario where you have one A5000 and 3 A3000s. The A5000 is setup as a ClassRom, and is configured to run the multi-tasking ClassShare software automatically on start up. All the computers (A5000 and A3000s) have a ClassNet interface and cabling added to allow communication to take place. The A3000s are configured to be ClassShare 'clients'.

When the machines are switched on they all see two hard disc icons; one representing the Applications partition and the other the User partition. The A5000 is directly connected to the hard disc but the A3000s are connected via the ClassNet. The A3000 users don't know this, however, and continue using their computers as if they had local hard discs. This 'transparent' setup means that any user can go to any computer and be familiar with the way in which it works.

At a later date, there is no reason why the A3000s could not have their own ClassRoms attached, improving overall system performance.



Working For Education

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QUALITY RELIABILITY

.....Network Tomorrow?



The ClassNet system mentioned above is the latest development in networking. Oak Solutions have combined industry standard Ethernet® hardware with a set of no-compromise protocols to deliver the fastest network yet produced for the Archimedes. Even though the hardware looks after collision detection and retries, our protocols provide further levels of data security to ensure maximum system reliability. Internal ClassNet interfaces are available for all Archimedes including the A30'N'0 and A4000.

ClassNet uses standard Ethernet cabling to interconnect the computers and setting up a small network couldn't be simpler. BNC connectors are used rather than the 5-pin DIN connectors used with Econet. One part of a T-piece is fitted onto the back of each interface and the other two parts are connected to the cable. At each end of the network, a terminator is plugged on to one side of the T-piece. ClassNet requires no clock.

Design & Technology
BBC network room
Library
Art
English
Archimedes network room
Science
File Servers

From a user's point of view, ClassNet looks just like Econet. If you are familiar with using Econet to log on to file servers then you can already use a ClassNet network. In fact, all your existing Level 4 File Servers, Printer Spoolers and Disc Sharers can still be used with ClassNet - it just works 40 times faster!

As ClassNet uses industry standard components, large school-wide networks can be built around off-the-shelf Ethernet Repeaters and Bridges. This means that there is a greater choice of supplier and many more people who are able to install your network.

Similarly, it is possible to run Acorn's AUN software on the ClassNet interface to gain access to other types of network and file servers via an AUN gateway station. Users may then log on to the remote file server as if it were connected to the same network. By supporting AUN and industry standards, Oak Solutions guarantee complete compatibility with Acorn's networking strategy, with the unique advantage that the ClassNet protocols offer unparalleled speeds.

To Industry Standards

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COMPATIBILITY PERFORMANCE



QUESTIONS AND ANSWERS

Q I own a BBC B computer and when I try to boot a program from disc by using SHIFT and BREAK, it sometimes takes me up to 20 attempts for the disc to boot. Why is this?

S Hawkes
Sheffield

A **When you press BREAK on a BBC, you can reset the machine in a number of ways depending on what other key or keys you're pressing at the time. A reset is a fairly major thing to do to a computer and not something you should do many times in quick succession.**

Because of this, Acorn's designers decided that, unlike all the other keys, the BREAK key would not go into action until it was released. This means that the machine doesn't check for any other key presses until you take your finger off BREAK so all those disc labels that say 'Press SHIFT/BREAK to start', really mean 'Press and then release BREAK while holding down the SHIFT key'.

The fact that this statement is a bit long for a standard disc label has caused ten years of confusion and is probably the source of your problem.

Q I am interested in writing a stock control program on my A5000 using barcodes. Where can I get a barcode reader for the Archimedes and how do I incorporate its output into a Basic program?

Irwin Kennedy
Londonderry

A **Datalogic UK makes a bar code interface which takes information from a light pen or a CCD (charge coupled device) scanner and passes it to a computer's serial port.**

To read this from Basic, you must write a short INKEY function, which waits for input from the RS423 port and, on receipt of a terminator such as a RETURN character, passes the bar code to your stock control system. Such system routines as OS_Byte 2 and OS_ReadLine could come in useful. A light pen and interface box will set you back about £375. Datalogic UK are on (0582) 794000.

STAR QUESTION

Q I am a 16 year old post-GCSE student and have recently been lent a 2Mb A3000. I have programmed extensively in Basic and dabbled in assembly language on a Master 128 and I would like to learn about programming the Archimedes. Where do I start?

Richard Edwards
Swindon

A The version of Basic used on the A3000 and its new sister machines, the A3010 and A3020 is essentially the same as you've been using on the Master but with some added features. I'd draw your attention to WHILE loops, multiple line IFs and CASE statements.

Like BBC Basic on the Master, it also features an assembler but this uses Arm mnemonics rather than 6502. If you understand the fundamentals of assembly code, you should find it relatively easy to move over to the Arm.

You will need some reference material but if you don't want to blow £79 on the *Risc Os Programmers Manual*, there are a number of cheaper books which may help. Try *Archimedes Assembly Language* by Mike Ginns or *Basic V* by Mike Williams, both from Dabs Press (061-773 8632). In addition, you could do worse than following our Arm code series, Assembly Line.



The latest Arc or the oldest: coding is just a matter of getting started

Q I have just purchased an A3000 for my children. My knowledge of computers is very limited so please help me as I am unable to get the £ sign to print out.

W Swarbrick
Ecclestone

A **Computers converse with printers by sending them streams of numbers and each number represents a character to be printed out. Many character codes are near-universally defined by the American Standard Code for Information Interchange (Ascii).**

This means that in the English speaking world, if you send the number 65, for example, to any printer, it will print an 'A', 32 will print a space. As this is an American standard, certain characters are not defined within it – most notably the pound sign.

To print the pound sign, you will need to make both your printer and your A3000 agree on which number is used to represent it. It is probable that the printer can be set up to use a number of different international character sets.

Follow the instructions in the maker's manual, and set your printer to the UK English set, which should use character 163 for '£', then reset the printer.

If this isn't possible, you can change the alphabet used by your computer with the commands, *COUNTRY and *CONFIGURE COUNTRY but, as the default setting is UK, it's better to leave this alone if possible.

Q I have been using the *Vu-Type* typing tutor with pupils to very good effect on the BBC B. Is there a version for the Archimedes machine?

Philip Warren
Balcarras School
Charlton Kings

A **I haven't been able to find a version of *Vu-Type* for the Archimedes, but other typing tutors and practice programs do exist. For example, take a look at *Typing Tutor* from Contex Computing (0234-838347) or at *Type*, which is on the current demonstration disc (number VIII) from The Datafile PD, 22 Duxford Drive, Aldergrove, Co Antrim BT29 4BG.**

Q I have had an A3000 for eight months. I am very interested in programming and I like to take programs apart to see how they work. I was trying to load data from a file using Basic and found that this would not work.

After looking at *Help Data*, I tried using the command RESTORE DATA and received these messages: Attempt to use badly nested error handler (or corrupt R13) and DATA pointer not found on stack for RESTORE DATA .

I could understand the second message (I think), but not the first. The corrupt R13 made me think perhaps there is a fault with the electronics inside the computer. Have I been worrying about nothing at all or is there something really wrong?

Richard Siggee
Doncaster

A **To set your mind at rest: R13 does not refer to a resistor or any other physical component in the computer but to a register, a slot in memory that is used directly by the Arm processor.**

Unlike some older computers I could mention, your A3000 does not have a 'crash and burn' command, and no programming instruction you're likely to give it will cause blue smoke to rise from the back of it.

So why did this problem occur in the first place? The purpose of RESTORE is to direct Basic to a particular line number in the current program from which it can read information held in DATA statements. RESTORE, READ and DATA do not refer to external data files.

To examine data files, you need commands like BGET# and OPENIN, but these are not much use unless you know the file format you're dealing with.

I strongly recommend that you make copies of all the files you plan to attack in this way and buy a good book on BBC Basic programming.

Q For many years, I did all my word processing on an Amstrad using *Locoscript*. Then a friend introduced me to the Archimedes and I have not looked back since.

I now use an A3000 with *1st Word Plus* and *Impression* and have sold the Amstrad. Unfortunately, I still have some important work, notably a short book, on 3in Amstrad discs. Is there any way at all that I can get the material transferred on to 3.5in discs in a format that can be read by my Archimedes?

K Elliot
Orpington, Kent

A **There is no simple answer to this problem. The 3in discs are almost exclusive to Amstrad PCW type computers and there is no drive unit for reading information from them into your Arc. There are, however, a few possibilities:**

- **Transfer the data as ASCII (raw text) down a serial cable using terminal software (for example, *Kermit*) on both machines. You'll need an Amstrad PCW machine with a serial output adapter.**

- **Use a scanner with optical character recognition software to read your text into the Archimedes. The accuracy of OCR is highly dependent on the quality of the scanned copy so, to minimise errors, use your best available printout.**

- **Pay a good copy typist to retype it. This will cost you money but it could save you a lot of time spent trying to borrow bits of hardware.**

HINTS & TIPS

Following Robert Seago's letter about backgound printing from Ram disc on the Archimedes (*BBC Acorn User* September 1992), here's a useful tip on the same subject from John Scott Patterson of Byker, Newcastle-upon-Tyne:

First of all, you must use the task manager to set up a large enough Ram disc for the printer file (this may be quite big if you're using bit-mapped graphics). Next, move the mouse pointer to your Printer icon and click on the mouse Menu button.

Choose the File option and give your output file a name – remember this is a different file from the document file upon which you are working and should therefore have a different name.

Drag the file icon to the Ram disc window and let go of the button. Once you've done this, select Print from your application, or drag the file on to the Printer icon.

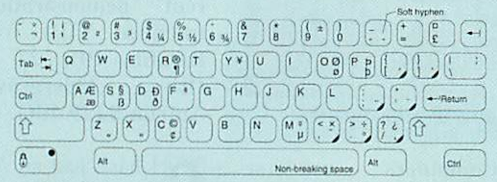
This builds a byte-by-byte image for the printer and sends it to the output file. Once you've finished 'printing to file', restore the printer driver to its normal mode of operation.

You can now print 'in the background' by simply dragging your output file from Ram disc to the Printer icon. This method is particularly effective in printing multiple copies of complex images as these only have to be composed once.

CUSTOMER HOTLINE

Every month in BAU, Alan Glover from the Acorn customer service department offers you Acorn's advice and support

- The Risc OS 3.1 upgrade contains an enhanced keyboard driver that makes many more characters readily available, such as accented characters, or symbols like ©. You can get at these extra characters using the ALT key. The keyboard map below shows all the characters that are available.



You can type the special characters shown in the keyboard map using the actions shown in figure 1.

For example, to type an upside-down exclamation mark (¡):

While holding down the SHIFT and ALT keys, press and release the '1' key ('¡' appears) then release the SHIFT and ALT keys.

TYPING ACCENTED CHARACTERS

Some keys (see figure 2) are marked with a black area in one corner.

Shift 1 Shift Alt 1

! ¡
1 ¹

1 Alt 1

FIGURE 1



FIGURE 2

These keys allow you to accent characters. The accent in each case is the character nearest the black area of the key. For example, to type an 'e' with an acute accent (é):

While holding down the ALT key, press and release the '[' key – nothing seems to happen. Release the ALT key. Press and release the 'e' key – 'é' appears. To get an accent as a character on its own, press the space bar as in step three.

- On a Risc OS 3 computer (particularly one with a 15-pin D-type connector for the monitor) you should switch on the monitor before the computer. Risc OS 3 has the ability to automatically determine the type of monitor attached by means of identity signals from the monitor. In some cases, these signals will only be present while the monitor is switched on, hence the monitor should be switched on first.

- If you are using the PC Emulator on the A4, you might find that the \ key does not work. This happens because the A4 has a UK style PC keyboard layout. Add 'KEYB UK' to your AUTOEXEC.BAT file to load the UK keyboard driver.

- Before the A5000 it was only possible to use a 5.25in floppy drive by adding a third-party disc buffer interface (because the 1772 floppy disc controller does not generate enough current to drive all kinds of 5.25in drive). Computers from the A5000 on use the 82C710 or 82C711 as their floppy disc controller. This device can drive a 5.25in drive directly, so a disc buffer interface is not needed. For more information about attaching additional floppy drives to the A5000 write to Acorn Customer Services, Fulbourn Road, Cherry Hinton, Cambridge, CB1 4JN and request the *Support Group Application Note – adding external floppy disc drives to the A5000.*

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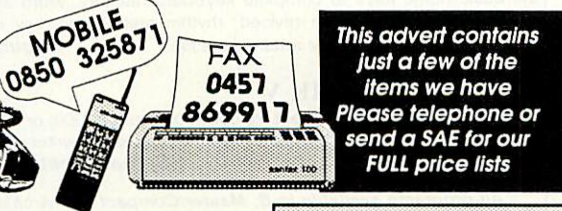
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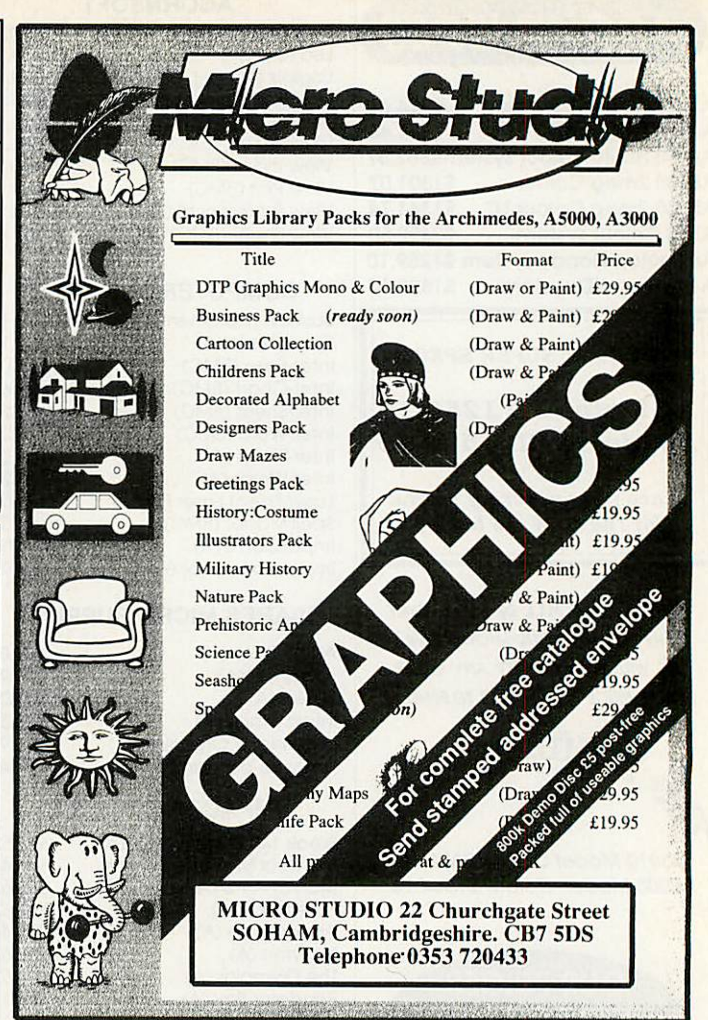


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INGRID DARRACOTT

Why not use your Beeb or Arc to investigate your family history? Danny Lawrence spells out the options

IT'S ALL RELATIVES

Genealogy is flourishing and is no longer the preserve of the professionals. Anyone with a taste for detective work can delve into their family history. Surprises are guaranteed. Not everyone may have a famous ancestor, but there are people of genuine interest, not to mention skeletons, in most family cupboards.

Birth, death and marriage records are still the basic sources for the family historian, but many other data sets are now readily accessible in public record offices, specialist libraries and through family history societies. Finding elusive bits of information requires considerable effort and ingenuity – but that is half the fun. However, organising and making effective use of all the data once it has been collected is usually just a pain. Fortunately, with a computer and specialised genealogical software, that too can become enjoyable – provided the software is easy to use, and is without frustrating limitations.

Understanding the relationships between individuals is at the heart of family history, so the capacity to register and keep track of those often complex relationships is critical to a good genealogical database. Ideally, the software should also recognise that genealogical data collection is inherently patchy, spasmodic and insecure. Valuable disc space will be squandered if a fixed amount is allocated to every entry, and the program will not earn its keep unless entries are easy and economical to update and revise. Good software must have the capacity to draw elaborate family trees in a variety of forms and produce reports on both specific individuals and families. It should also have the capacity to import and export information in the accepted international standard format.

Despite the obvious benefits to be derived from using computers, most family historians make no use of them. A June 1991 survey of the 2,500-strong membership of the Cornwall Family History Society revealed that only 7 percent of its UK members own a computer.

Similar societies, with fast growing memberships exist in virtually all counties. Add to these the many family historians who remain outside such networks and it is clear that the potential for sales of hardware and software in this market is enormous. Are Acorn software houses well placed to exploit it?

ACORN SOFTWARE

Acorn was well placed when this niche market emerged. At the time the Society of Genealogists published the first issue of *Computers in Genealogy* in

1982, there was not an IBM PC clone in sight. A survey of the 300 original subscribers showed Acorn to be a leading player. Several genealogical packages were developed for Acorn machines and, even into the late 1980s, articles with an Acorn focus featured prominently in the journal.

However, an analysis of subsequent membership surveys shows Acorn slipping further and further behind the competition. Acorn computers were used by 33 percent of respondents in 1986. By 1988 the proportion had fallen to 27 percent. The latest survey shows Acorn equipment is used by no more than 11 percent. Only 2.8 percent of these use an Archimedes.

The fact that so few genealogists use an Archimedes, when it is an ideal computer for the range of tasks facing them, is something Acorn should ponder. The story of its decline in this important niche market is a salutary tale.

The three most significant genealogy programs developed for variants of the BBC B are Murray Kennedy's *Family History System*, Graham Crow's *Kinship* and David Lane's *Heritage*. All three are competent programs, inevitably restricted in what they have to offer by the limitations of eight-bit hardware.

By contrast, the fast, powerful and flexible Archimedes is an ideal machine for genealogical applications. Yet, five years after its release, there are still only two packages available for it – compared to scores for the PC. Even those using Beebs and Masters have a greater choice. It is no exaggeration to say that the Acorn genealogical scene is moribund. Indeed not a single entry under genealogy or family history has appeared in *BAU* since mid-1989.

Read Acorn's product catalogue and the picture appears brighter. Five packages are listed under genealogy. The reality is different – only two of the five actually exist. Simtron's *Roots* has yet to appear and repeated requests for a release date have been ignored. The *Premier Information System* is powerful enough to produce a good genealogical application – but, as a prompt response from Circle Software confirmed, its development is still some time off. Oak Solutions lists *Genesis Plus* under genealogy in the catalogue, but it advertises no specifically genealogical application.

For Archimedes owners, the current choice is between Murray Kennedy's revamped *Family History System* and Minerva's *Ancestry*. Neither is Risc OS compliant. The *Family History System* comes from the same stable as *Pedigree*, the excellent PC package developed by the father and son team of Murray and Andrew Kennedy. However, though from the same stable, it is not in the same league. It is competent and cheap (£25.95) but makes no claim to be state of the art.

Minerva's claims for *Ancestry* are less modest. It is priced accordingly (£81.75). Advertised on its launch in 1989 as 'the ultimate in computerised genealogy', it received a mixed reception. Though praised for many of its features, the most telling criticism was that (unlike the *Family History System*) it could neither import nor export data in GEDCOM format.

Whatever the limitations of that format, the influence of the Church of Latter Day Saints (the Mormons) has established it as the *de facto* standard for the exchange of genealogical information between programs and researchers. That is why their own program, *Personal Ancestral File*, is the key player in the PC world. Though not the best software available, it is used world-wide. Software that ignores its influence seems destined to be ignored by many potential purchasers.

In short, those of us interested in genealogy who have kept faith with Acorn face a dilemma: settle for PC software running slowly under the emulator or choose between only two packages, neither of which is Risc OS compliant.

FAMILY FACTFINDING

Thinking of taking up genealogy? Then:

- **Ask all your relatives for information before it is too late.**
- **Contact the family history society operating in your search area.**
- **Organise all your notes and records systematically from the outset.**
- **Read an introductory book on data sources before you search through any public records.**
- **Never take anything for granted – check and double check everything.**

For further information on genealogy generally and demonstrations of genealogical software in particular, contact the Society of Genealogists, 14 Charterhouse Buildings, Goswell Road, London EC1 7BA.

PC EMULATION

Given the limitations in the available Arc software, I chose to take advantage of Acorn's PC emulator and, from the large range of available software, opted for *Pedigree* (£50) and *Biographer* (£18.75).

Ironically, the development of *Pedigree* was started on a BBC B in 1986. It has excellent facilities. Within the limits of MS-Dos it is easy to use, with detailed on-screen help. A free help-line is provided in the evenings when one is most likely to need it. The package contains all the features identified above. Data entry and revisions are easy and economical. A variety of ancestor and descendant charts can be produced and conventional reports are easily customised.

The program makes efficient use of disc space and, crucially, provides for the import and export of data in GEDCOM format (and CSV). Utilities are included to help with the input of parish record and census data, one-name studies and personalised letters. For an extra five pounds you can join a user group.

Biographer is a newer program from Peter Cooley and makes a superb complement to *Pedigree*. Input the GEDCOM data output from *Pedigree*, and it creates customised biographies of individuals within their family context. The compiled biographies identify inevitable inconsistencies between different data sources and throw up clues for new lines of investigation. Ages are automatically calculated from dates and checked against a range of likely parameters (for example, period of child-bearing) to provide warnings of dubious entries.

Extrapolations from known information provide predictions about the family structures expected in census returns, increasing the chances that costly visits to scrutinise them will prove worthwhile. *Biographer* also provides for the automatic input into biographies of historical events that loomed large in the lives of those concerned.

Running *Pedigree* and *Biographer* on the Archimedes is entirely trouble-free and multitasking actually offers facilities not available to those using PCs. For example, an Arc word processor can be run alongside *Pedigree*.

I have no desire to swap my Arc for a PC but the emulator does give me a foot in both camps. Unless the price of the Arm3 or Aleph's PC card falls, I will continue to use the emulator on my Arm2 machine. It may be slow but it gives me cheap and reliable access to the software of my choice.

Ideally, however, I would like to see the Risc OS genealogical software that Acorn's excellent range of machines deserves. Acorn software houses need to work to recover the genealogical ground lost in recent years.

PRODUCT DETAILS

Product: ***Ancestry***
Supplier: Minerva Software Tel: (0392) 437756
Price: £81.75
Product: ***Biographer***
Supplier: The Ideal Present Club, 20 Linforth Drive, Streetly, Sutton Coldfield, B74 2EQ.
Price: £18.95
Product: ***Family History System***
Supplier: Micro-Aid, 1 Kildonan Courtyard, Barhill, Girvan, South Ayrshire KA26 0PS.
Price: £25.95
Product: ***Heritage***
Supplier: Bill Woolen, The Heritage User Group, Greensward, Townsend, Harwell, Didcot, Oxon OX11 0DX.
Price: £20
Product: ***Pedigree***
Supplier: Pedigree Software, 123 Links Drive, Solihull, B91 2DJ.
Price: £50
Product: ***Kinship***
Supplier: AVP, School Hill Centre, Chepstow, Gwent, NP6 5PH.
Price: £35

ACORN USER ADVERTISEMENT PAGES – NOVEMBER 1992

PUBLIC IMAGE

It's not always free, but it comes pretty close. David Dade surveys some exciting and useful public domain programs

There's a wealth of free, high quality software available from public domain libraries and bulletin boards. Interesting programs can be found on almost any aspect of computing, including programming utilities, filing systems, graphics drawing, sound samples and just plain fun.

Here's a glimpse at a few from the huge selection of material to be found for free. All the programs described here, except the largest, are included on this month's *BBC Acorn User* subscription disc.

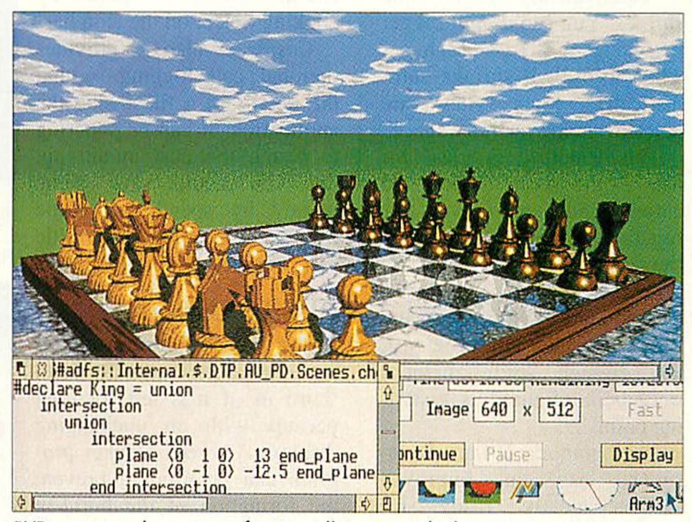
RAY TRACING

PVRay is a ray tracing program that can draw scenes of incredible complexity, with finely detailed surface textures, highlighting and geometric precision from text script files. The script files are written in a special language that describes the scene exactly.

A small part of a sample script file can be seen below the chessboard scene (above right) that it describes. This scene was rendered as a Mode 21 sprite, and because maximum rendering accuracy was chosen from the *PVRay* control panel, this took over a day to draw. Many sample script files are available, and the resulting images can be drawn and saved in a number of formats including Sprite, PC Targa (a 24-bit colour standard) and Clear, which are all *Translator*-compatible.

The program has a desktop multitasking front-end that installs on the icon bar. When a scene description file is dropped on the icon, the *PVray* control panel window opens. This window allows selection of the sprite and display mode, the size of the image rendered, the buffer size for the output file and an anti-aliasing switch. If set, this will improve the edges in the final picture, but increases the time taken by a large amount. A further menu allows selection of the fidelity of the drawing, ranging from colour changes only to full shadows and textures. Clicking on a *!Run* file starts the tracing, and the progress of the picture can be monitored as it is traced.

It must be said that the most impressive pictures can take a very long time to draw, and the program allows tracing to start and stop at specific lines, so you could do the drawing in parts – joining them up might be tricky though! To speed up the drawing process, a faster non-multitasking mode is also available.



PVRay can render scenes of extraordinary complexity

SPEAKING CLOCK

Tim is an unobtrusive clock that lives on the icon bar as a pair of luscious lips, but when you click the mouse on them, they tell you the time – literally, in digitally sampled speech. The dulcet tones of the author – Tim Browse – are heard, but sound a little bored at certain times. As Tim explains in the accompanying Help file, this is deliberate and assists the smooth transition between sections of sampled speech. The time is spoken in a friendly 'rough-time' style: 'It's nearly quarter past eleven in the morning' and the program thoughtfully includes provision for adjusting the sample playback speed for Archimedes users with a VIDC enhancer (needed for some multiscan monitors). For students of C programming, the full source code and Make file for Acorn C version 4 are included.

A BETTER RAMDISC

This is a Ram filing system called MemFS which uses the system sprite area of Risc OS. With the built-in RamFS, once

WHAT IS PD?

There is a lot of confusion about the meaning of public domain as applied to software. There seems to be no legal definition but the general perception is that if an author declares his work to be 'in the public domain', anyone can use or copy the program, in whole or in part, without reference or permission from the original author. Often the author will attach conditions about retaining copyright or requiring permission to distribute. This illustrates that public domain (PD) really only means what each author using the term wants it to mean. However, unconditional PD code passes into general use and may indeed form part of another author's additional work that the new author chooses to claim copyright to.

Not many so-called PD programs actually fall into this unconditional category, for the authors frequently want to retain the copyright of, and receive kudos for their programs, while allowing free use and distribution to get themselves known. Programs like this are usually called freeware.

Freeware is generally understood to mean software that retains the copyright of the author, but which may be freely copied and used by all. The author will often require permission before distribution by PD libraries and magazine discs, but will otherwise permit distribution by bulletin boards as long as the original code is preserved in whole.

Shareware is the term used for software that is provided and distributed free, but 'on approval', pending payment of a nominal sum to the author if continued use is intended. After the specified approval time, you are expected either to wipe the program or make the payment. This payment counts as a user registration and often entitles the user to a more recent version or regular updates to the software. There is no way the author can ensure that the users send any payment, relying simply upon trust and honesty. It's a sad fact that in the UK, shareware does not work well for authors compared to its well-established practice in the US.

Careware, sometimes called charityware, is a way of distributing low-cost software and helping charitable causes at the same time. Several ways of obtaining careware exist. The user can send the author a donation to be forwarded to a charity of the author's choice, or they can make one directly to a charity of the supplier's choice. In both cases, the user has to pay up before getting access to the software.

you have run out of Ramdisc space, you can't increase it without deleting the whole Ramdisc contents.

MemFS behaves just like a normal filing system, but resizes dynamically, which means it automatically grows and shrinks. You can drag it bigger by using the Task Manager when its full. It shrinks automatically when files are deleted, saving memory space.

This Ramdisc is ideal for use as the scrap device and automatically takes over this function. There are just a few limitations – if an old-style program executes a rarely-encountered *SNEW command this will delete the contents, and enough sprite memory must be configured as a starting point.

The author, Brian Brunswick, has an improved version nearly ready for release that can use a slave filing system instead of, or as well as, the sprite area, compresses and decompresses files CFS-style and has no 77-object limit like ADFS does.

TRAIN ROBBERS . . .

Locomotive is a desktop cartoon that re-enacts the Great Train Robbery along the top of your icon bar. A bullion train steams out of a tunnel at the end of the icon bar, chased by three horsemen who blow up the track in an attempt to steal the gold. Text 'sound' effects can be obtained by running the Acorn Interactive Help application and placing the mouse pointer over the action. A clever and amusing way to make friends with the desktop. Best viewed with Arm3 caches turned off.

. . . DODGE THE BILL

Coster shows you a continuously updated display of the duration and cost of any phone call made by your modem. The program monitors the serial port signals and knows when the call starts and ends.

The rate at which the call is charged is selected from a small window opened by clicking the menu button on the icon, and the selection made can be saved as the default. The normal rates of L, a, b1 and b are provided as well as a special CIX rate which calculates the time charge for the CIX service instead of the cost of the phone call. If they change, the rates can be adjusted. The time and charge window is opened by clicking Select on the icon bar.

Coster also provides optional call logging, saving the details in a file inside the application. It can be sobering to watch the cost mount up, but you could save some money by spending a little time downloading this little gem from a bulletin board.

OUT TO LUNCH

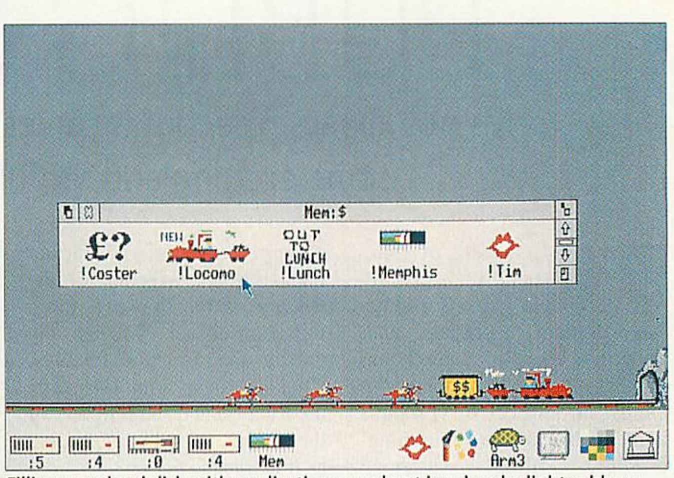
It is a fact that even a colour monitor screen can suffer from 'burn in' if it is left for long periods with an unchanging display. A screen blanker program can be used to prevent the formation of the burnt-in icon bar shape that is often found on Archimedes monitors. *Out To Lunch,* by Peter Gaunt, is just such a program.

Out To Lunch has several advantages over other desktop screen blankers. The program installs as a module task, which means that it takes up far less memory that a normal application Wimp task, and can survive an exit from the desktop and even a soft reset.

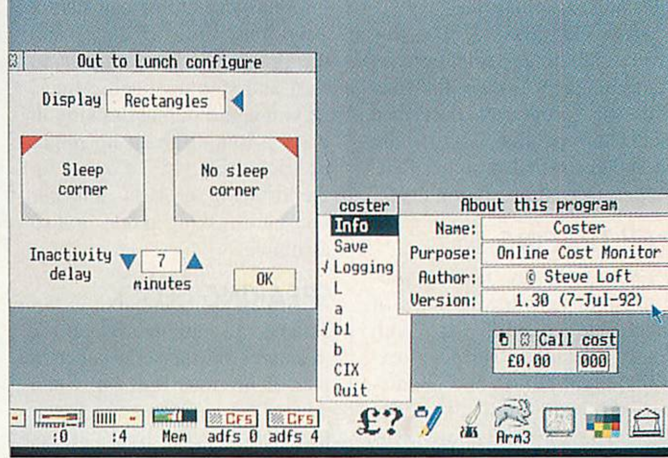
After a preset time, during which no key-presses or mouse movements have been detected, *Out To Lunch* will blank the screen, replacing it with a simple animation to let you know your monitor is still actually on. The desktop will reappear immediately a key is pressed or the mouse is moved, or if another running program opens a window at the top of the window 'stack'. The screen can also be blanked at any time by moving the pointer to a 'sleep corner' of the screen, or blanking can be inhibited by moving it to a 'no-sleep corner', as set by the configuration program.

Out To Lunch is easily configured by holding down an Alt key while double-clicking on its filer icon. The configuration window allows selection of display – a list of simple animations including coloured lines, circles, rectangles, a Dali-esque dripping desktop, sliding blocks and of course plain black. Other screen 'modules' can be added, such as a fishy under-seascape. The inactivity delay and sleep/no-sleep corners are also configured here. *Out To Lunch* is a simple but essential addition to your *!Boot* routine that will save your screen and calm your nerves while waiting for inspiration.

Next month we'll take a look at some more low-cost, high-quality, software available at low cost as shareware and careware classifications.



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A screen blanker happily co-existing with a comms cost monitor

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PD LIBRARIES:
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Arcaynia, PO Box 1927, Sutton Coldfield B74 3QZ
The Datastream, 32 Hollinwell Avenue, Wollaton, Nottingham NG8 1JZ
Lowcost PD, 6 Furzeland House, Sheephouse way, New Malden, Surrey KT3 5PH
Moribund Hedgehog PD, 3 Rodmell Close, Bromley Cross, Bolton, BL7 9DT
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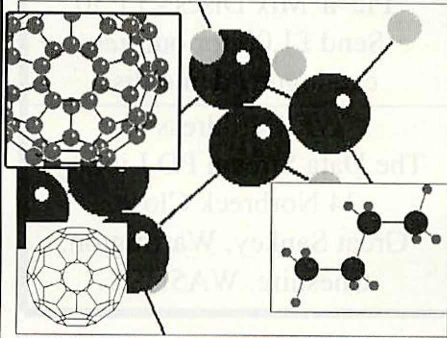
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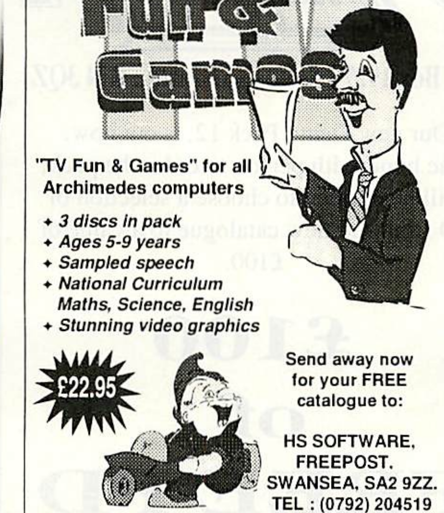
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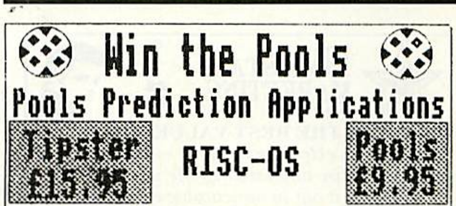
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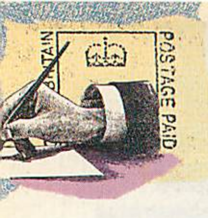
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£15 STAR LETTER

Archimedes owners – do you remember when double-clicking was a matter of simply clicking twice? If, like me, you have an old Archimedes, you may find the mouse buttons becoming a little touchy – a replacement will cost around £30. However, help is at hand, as the new Maplin catalogue contains suitable replacements.

The replacement buttons are listed on pages 541 to 542 of the 1993 Maplin catalogue – button type 105. Three are required at a price of only 32p each! Including p&p, it's only a tiny fraction of the cost of replacing the mouse.

Installing the buttons is fairly simple – dismantle the mouse, remove the PCB from the inside and simply de-solder the old buttons, insert the new ones and reassemble the mouse. You may have to reassemble it a few times – it's a bit touch and go as to whether or not the main PCB is in correctly (it needs to be lined up carefully with the rotating discs which record the movement of the mouse). If it doesn't work correctly, just take it to bits and put it back together again.

When all this is done you have a mouse with working buttons, which takes some time to get used to again. The buttons are rated at 100,000 presses, which should be good for another few years.

M R Edwards
Welwyn Garden City

Maplin Electronics can be contacted at PO Box 3, Rayleigh, Essex SS6 8LR.

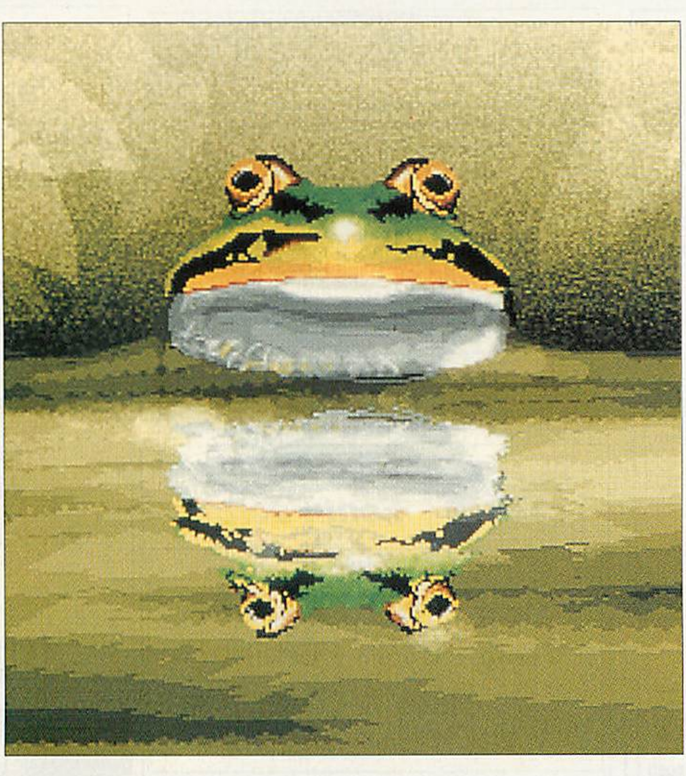
STILL PAINTING

I hope your correspondent, Grant Naylor, is reading this month's letters page. In the October issue he lamented the lack of an Archimedes art package as good as *Deluxe Paint* on the Atari ST, yet such does exist in the form of *Arcol Desktop*. *Arcol* was reviewed in your June issue, and highlighted again in September, in an article by Pete Worral about his Birmingham art exhibition.

The original *Arcol* was modelled closely on the Atari and Amiga packages and then enhanced with features to permit dithered fills in two to 16 colours, using sprites as tools, and even painting with light and shade! It will operate in any 256-colour screen mode, and will even mix sprites created at different resolutions.

I have enclosed a copy of *Arcol Desktop* for you to pass on to Mr Naylor, together with the *Design Worksheet* pack and disc so he can see exactly what can be achieved with this package.

Paul M Richardson
Explan UK Ltd





Sprites from Arcol Desktop: a match for Deluxe Paint?

RISC OS NOT FREE?

I am a humble 2Mb A3000 user who is all in favour of the advent of Risc OS 3. However reading the Risc OS 3 technical specifications in front of me it states:

'In designing Risc OS 3, compatibility and consistency with Risc OS 2 have been given high priority.'

I agree entirely, but I have noticed that a lot of programmers are short-changing Risc OS 2 users when it wouldn't be too hard to let them in on the game.

I am worried that users who can't afford Risc OS 3 are going to find themselves in the dark, especially the A300 series users who have to buy a carrier board. I think it's in Acorn's best interest to make the upgrade as painless as possible, or at least for the programmers to put a little more thought into what they write.

A Ashbey
Bolton

SMALL PROBLEMS

The article on repairs by Richard Garret (*BAU* October 1992) only covered hardware problems – I was recently asked to look at a BBC that would not give the answers the user wanted.

At first I said, 'You've probably missed a variable out of one of the equations'.

'No,' Came the reply, 'the same program with the same data run on a different computer gives the correct answers'.

I decided to try something simple; PRINT 3*3, answer 9. PRINT 3^3, answer 9.3. These problems were obviously corrupt maths routines in the Basic chip. The solution is to use the computer for text processing only.

This tale highlights a problem with all digital equipment, namely the partial failure of a component. Integrated circuits contain thousands of semiconductor switches and the failure of one switch can be difficult, or impossible to detect.

I wonder how many computer users periodically perform benchmark and calculation checks? There can't be many.

Mike Carr
Sheffield

YOUR THOUGHTS

What do you think about Archimedes graphics packages – are they good enough? How do you rate the new Acorn machines? Do you find our reviews and feature articles useful and entertaining?

Something on your mind, about Acorn, *BAU* or anything else? Then why not send in your thoughts to Letters Page, BBC Acorn User, 101 Bayham Street, London, NW1 0AG? There's a £15 prize for the most stimulating or informative letter of the month.

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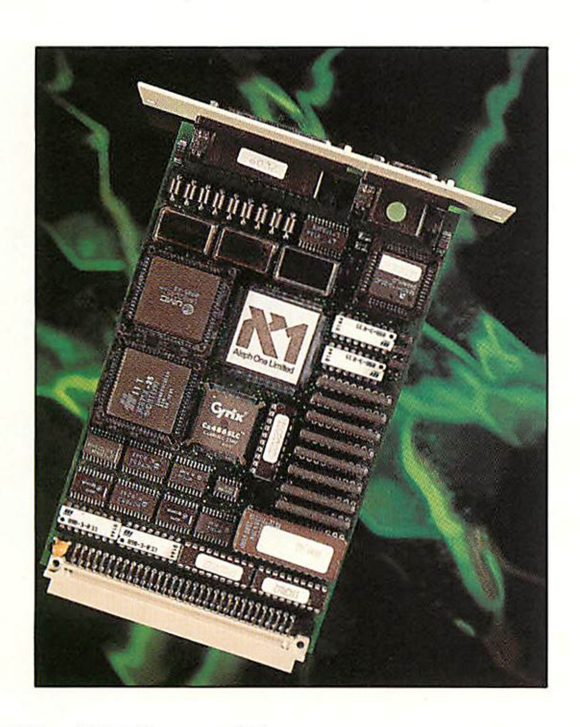
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